PERSONALITIES

By George F. Taubeneck

Development of Specialty Selling Formula

The seventh instalment of the editor's story on the Development of the Specialty Selling Formula by John H. Patterson, founder of the National Cash Register Co., appears on this page. Readers who knew John Patterson are invited to submit anecdotes about Patterson and his methods—incidents which might be illustrative of any of the material they may read herein. These anecdotes will be incorporated into the general story, with full credit given to those who send them in to us.

Numbers of readers have been sending us information amplifying the material in this series—information which will be inserted and correlated into future instalments.

Birth of the Idea of Enlisting the Salesman's Family

Pencil and paper were always on Patterson's bedside table so that he might jot down any new ideas that came to him in the night. One idea which was written on that pad during a night when he rolled and tossed in a vain attempt to court slumber was that of enlisting the aid of salesmen's wives in an effort to get still better results from his sales force.

Here he applied some of his favorite psychology: he believed that by giving each salesman's family a taste of luxury, the salesman could be spurred into working still more energetically and getting more sales.

As part of his scheme to arouse desire for the things money can buy, he often sent salesmen and their families to New York City or to Europe at the company's expense. During these trips, Patterson asked that the families stay at the best hotels; and each woman who went to Europe received a Paris gown as a gift from the company.

When employees fell into financial holes, Patterson took no small delight in extricating them—believing that their families would be so grateful they would urge the man of the house to redouble his efforts in return for the lift.

Prizes given at the close of the frequent sales contests were invariably chosen for the appeal they would have for the salesman's family.

These prizes were also found to be conspicuously elegant when placed among the more modest furnishings of the salesman's home. Patterson thus hoped to create a desire for other articles which would match his gift. A prize chair, for instance, might make the family uncomfortable until a whole new suite of furniture of similar quality had been earned. If—or when—this ambition for better things was created in a family, Patterson had achieved his purpose.

Patterson's work among salesmen's wives finally culminated in a most interesting and unique gathering at Dayton—a convention of wives.

Invitations were sent to the wives of all salesmen, and somewhat to the surprise of other N.C.R. executives, most of them accepted! Patterson himself described the meeting as "a riot of enthusiasm."

On the first day he showed them that they were as important a link in the N.C.R. business chain as were the factory workers and the executives; that their cooperation was *needed*. That put the wives "on his side" almost at once.

Next the women were taken through the factory. There they saw a series of playlets—one demonstrating the salesman's work in solving merchants' problems, another showing what a cash register would do for a merchant; and a third showing the salesman's approach and demonstration.

These skits attempted to give the wives some notion of the problems their husbands bumped into every day.

An illustrated lecture on clothes showed why the salesman must dress well, and tried to answer clearly the question many wives were asking: "Why should my husband buy a $60 suit when I cannot afford a gown that costs that much?"—if such a question ever can be answered satisfactorily and finally.

Patterson brought the convention to a close with another playlet, this time contrasting the right and wrong kinds of wives—the wife who helps her husband in his work, and the kind who hinders him in it—and how and why.

Wherever the wives went they were confronted with placards bearing this eight-point message:

1. A salesman should have plenty of wholesome food—not too much, but enough—and it should be eaten under pleasant conditions.
2. He should get enough sleep.
3. He should start to work early, because the more prospects he interviews the more sales he will make.
4. He should frequently make demonstrations to his wife, and then have her criticize his presentation. The wife should point out his use of long words not understandable to most prospects.
5. Each wife should be on the lookout for good tips, and keep two eyes open in stores for possible prospects.
6. She should ask for a receipt with her purchase, so as to encourage use of receipt printers.
7. She should not take him away from his work. Patterson said: "If he has to demonstrate after business hours, and that interferes with going to a theater, she should insist that the social affair be given up, and that business have the right of way."
8. She should encourage him when he is ready to give up.

That the plan worked is attested to by Patterson himself. Some time after this convention he made a check-up which revealed that many salesmen whose wives had been at the meeting began almost immediately to make more sales.

As a general explanation of why he held the wives' convention and persisted in sending wives of his employees booklets on food, income budgeting, good housekeeping, etc., Patterson said:

"I have held for many years that the wife of a salesman—and indeed the wife of any other man in business—should understand his business thoroughly and thus be able to help him in every way possible.

"She cannot help him unless she understands exactly what he is up against in his efforts to bring in a steady supply of money. If a man can intelligently talk over the troubles of the day on his return at night, he will be a more efficient man the next day.'"

* * *

Birth of the Quota System

When the exclusive territory idea popped into the caldron of Patterson's mind, which was constantly seething with plans to stimulate salesmen's efforts, by some inexplicable alchemistry it fused into being the quota system—another brand new element in the rapidly-taking-shape formula for specialty selling.

He had given his salesmen something unprecedented in the guaranteed territory. In return for this concession, he believed he was entitled to a guaranteed business from that territory. So came about sales quotas, a practically indispensable feature of all specialty selling plans today.

To his salesmen, he said, "Experience shows that a register can be sold for every 400 people in every town in the United States. Divide the population of your territory by 400, and the result will show the number of registers that can be sold in your territory. Multiply the result by your commission. The result will be the amount of money you can make providing you push the business."

"How do you sell?" had been the question asked the men gathered at the first sales convention. Now as the sales organization grew and sales methods improved, Patterson linked a new question to the old one. He began asking, "How many orders can we count on from your territory next month?"

It soon became apparent that the only equitable basis for a comparison of sales records was the dollar volume of business produced by each salesman. Regardless of the number of machines sold by one man, his value to the company depended upon the profit the company earned from his sales.

So the number of unit sales as a basis of comparison was discontinued, and a "point system" was substituted. One point represented $25 of the price of the register. Thus, a man who sold three $200 machines garnered 24 points; whereas a man who sold five $100 machines earned 20 points. Under the old system the latter salesman would have enjoyed higher ranking.

Inequalities in the territories were offset by assigning to each district a quota in points. At first this was based on the arbitrary scale of one register per 400 people; but this basis was altered and modified as time went on, the rating being determined according to the size of the territory, the type of inhabitants, and the amount of business done there by N.C.R. previously.

Efficiency of a salesman was determined by referring to the percentage of quota he sold each month. Brilliant sales records frequently brought promotion.

Never was a quota raised until market conditions seemed to warrant it. Nor was a quota ever assigned to any salesman on the basis of his ability or personality. It was based absolutely on a study of the market in which the salesman worked. It was raised only when the wealth or population of its territory increased.

Patterson's contemporaries, ever watchful of the Super-Showman, were astounded by the fact that he expected his men to sell the same quota every year. Critics maintained that no salesman could consistently sell an unvarying quota of a non-perishable product.

By the too-often-right-to-be-comfortable Patterson proved to them, with yearly sales records, that their criticism was without substantiation.

The natural outgrowth of the quota system was an organization whose membership was made up of star salesmen. These men had made, or beaten, their yearly quotas. Membership in the new "Hundred Point Club" was the recognition they received. (Here is another "birth" of a widely used portion of the present-day specialty selling formula — fraternal, badge-wearing organizations of quota-breaking salesmen. This one will be discussed with a few brief words and a single, loud "huzza!").

All of these N.C.R. salesmen had, during the past year, made an average of 100 sales "points" $25 per point) a month, or 1,200 per year.

Officers in the club were not elected by popular vote. The first salesman to make 1,200 points during the year automatically became club president for that year, the next to make his year's quota became vice-president, and so on down through the list of officers.

At the end of each business year, all members of the honorary organization met in Dayton for a convention lasting three or four days or longer. There they were given the best in hotel accommodations and amusements. Further sales training—even for these first-magnitude stars—was also in order at their celebratory gatherings.

Mr. Gibbs, to whom we are all indebted for his Boswellian recollections of the N.C.R., gives us some idea of the magnitude of the yearly "Hundred Point" meetings in his description of the 1910 convention. He says:

"The One Hundred Point convention held at the close of 1910 was attended by 188 salesmen. Each of these men received $150 in freshly minted gold, also a gold scarf pin.

"The leading salesman for each district was further presented with a beautiful gold watch, chain, match safe, knife, etc. As there were 188 agents at the last session, and each man received $150 in gold, there was a total of $28,000 in gold distributed among them. Each watch and chain had a value of at least $300.

"A daily newspaper was published from the factory printing department, giving cartoons of the different salesmen and the important events that happened during the day, a synopsis of the addresses made, and a bright, crisp comment upon the day's doings.

"Page advertisements showing pictures of the 188 agents, views of the cash register factory at Dayton, and pictures of special trains were published in the week previous to the convention in the leading newspapers of the United States.

"An explanation was made of these advertisements, of the work that had been done by the men and the meeting was written up in a most interesting and vivid style. It made splendid advertising matter for the company because it was so unusual.

"To show the care that was taken in handling the details of this convention, note that at the banquet, which was held in the middle of the week, each man found in front of his place a menu card containing his own photograph and his name printed in gold. As over 250 sat down to this banquet, an idea can be had of the work necessary to look after this one detail."

* * *

Birth of Factory Open House Policy

In the days B. P. (Before Patterson—not Prohibition) factories were as closely guarded as a hand-picked harem in the good old times when being a Turkish sultan meant something. Factory owners of the old school shied from publicity as though it were a plague. Visitors might as well attempt to scale the heights of Mt. Everest as enter a factory for the purpose of "seeing the wheels go round." Each plant was a little Tibet, a "forbidden city" in itself. (We've sorta chased around Eurasia in this paragraph, haven't we?)

It has already been intimated that Patterson cared naught for precedence. Instead of hiring guards to give callers the icy shrug, he used all his showmanship and ingenuity to attract visitors and so effectively to impress them, once they were inside his plant, that they would spread far, and possibly wide, stories of the factory's efficiency.

In *Printer's Ink* for November 9, 1911, E. D. Gibbs, once Patterson's advertising manager, discusses NCR factory tours, and shows plainly the extent to which "the old man" dramatized everything that was dramatizable—plus a great deal that nobody else thought susceptible to showmanship until this Belasco of business showed them how.

Gibbs declared: "If I were asked for an opinion on the best advertising National Cash Register has done, I should answer, 'Factory Visitors.' From 5,000 to 6,000 people visit the N.C.R. plant at Dayton every month. Twice a day, hundreds are taken through the big buildings."

After reading the following statements by Gibbs, one finds it easy to believe that persons, having once been through the factories, become A-1 walking advertisements for Patterson's cash registers—just as the shrewd old man knew they would.

Excerpts from the Gibbs' article reveal some of Patterson's "open house" policies:

"With exception of work in the experimental and inventions departments, no detail of the business is kept a secret from anyone who cares to ask questions.

"Visitors are free to ask about different details, and their questions are as freely answered. When you call at the plant, you can ascertain the amount of money paid out for labor, the business done yesterday, last week, last month, or last year.

"You can find out what the purchases of raw material amount to. You can learn of the amount of money represented by notes from purchasers held in the big steel vaults. They will tell you of the payrolls of the company in lump amounts.

"You can find out, if you have nerve enough to ask the question, what the salary of the president of the company amounts to. The business done abroad, its values in dollars and cents—this you can learn."

Gibbs proceeds to describe a trip through the plant, and shows vividly, amusingly at times, the extent to which Patterson went to sell his visitors on National Cash Register. He says:

"The main street out towards the factory is lined with trees and shrubbery, planted by the N.C.R. Even the bridge over the old canal has flowering plants and shrubs on either side of it, placed there by President Patterson.

"We pass a big race track. Years ago this track was enclosed by a rough board fence covered with painted signs. Now there is a wire fence and countless vines, trees, and shrubs: another N.C.R. idea.

"Then the huge buildings of the N.C.R. come into view—about eight or nine of them, each four stories high and 900 feet long. They are painted a uniform buff.

"The administration building is 12 stories high and most imposing. We get out and enter. An attendant greets us, ushers us into a big reception room, and we find that we have about an hour to wait. But soon we discover that there is plenty to do to occupy our time. Other attendants invite us to visit the rooms on the lower floor.

"A most unusual and novel spectacle greets us as we look down the main hall. On each side of this hall are arranged retail stores of various kinds, show windows and all. Every detail of these stores is complete.

"They are fully equipped with goods and fixtures. Counters, scales, safes, display racks, they are all there exactly as we would find them in genuine stores. The butcher shop has papier mache ribs of beef, chickens, lamb, mutton, etc., on display.

"The drug store is filled with perfumes, soap, toilet articles, and other things sold in that type of store. The book store has rows of the latest fiction; the department stores, 'ribbons and laces to set off the faces,' as well as dress goods and knick-knacks of all kinds.

"In each is a cash register suitable to the particular line of business represented. The show windows are wonderful in their arrangement of goods. Everything is brilliantly lit up with artificial light.

"The outside of the stores have appropriate signs. All is complete; not a detail is missing. We wander from one to the other, lost in amazement. We marvel at the ingenuity of the idea and are lost in admiration at the way in which it has been carried out.

"Then we go into an exhibition room devoted to all sorts of things. Here we see the first desk used by the company. The ox yoke that the Patterson brothers had on the old farm is on display. Wonderful gifts and letters from prominent personages are in glass cases.

"Huge working models of cash registers used in education of factory employees in the early days of the business are exhibited. A most interesting display, even to outsiders. The things in this room have a history.

"Uniformed guides now appear and tell us that the trip through the factory will begin in a few moments. You have brought your mother with you—an elderly lady perhaps; or maybe one of your party is lame.

"Up comes a guide, pushing a big, comfortable roller chair—a regular Atlantic City affair—and the mother or lame friend is soon comfortably seated, and off we go.

"There are plenty of guides. President Patterson says, 'Whenever you have six workmen, you need a foreman.' The same principle holds good in showing people through the factory.

"The guides have been as carefully trained in their work as the salesmen have been in theirs. There is a school for guides at the factory, and they are taught what to say, and when and where to say it.

"At once we begin to ask questions, and the guides answer us briefly, clearly, and comprehensively. If you ask anything about the early days of the business, you are requested to wait for the factory lecture, which your guide tells you will be given at the close of the trip in the big lecture room.

"We pass down the long halls and learn all about the different departments. One room is filled with hundreds of girls. Each one wears a large white apron which completely covers her dress.

"These are kept clean at the company's expense. We learn that all women employees arrive at the factory 15 minutes later than the men, and leave 10 minutes later.

"They thus have the street cars to themselves, enabling them to travel more comfortably than if the men and women were crowded together, as they would be if they arrived and departed at the same time.

"We see the shower baths, rest rooms, doctors' offices, etc., that have so often been written about in the many descriptions of this great plant.

"When we get our first view of one of the big machinery departments, where long lines of rapidly whirring machines are operating, we are puzzled to find that all of the non-working parts of the machinery are painted a light buff.

(To Be Continued Next Week)

Son & Heir Gets Some Sun & Air

You don't need to take candy from a baby these days—not since commercial refrigeration salesmen have installed ice cream cabinets everywhere from mighty department stores to cubbyhole newsstands. Give the youngster ice cream—he'll like it, it's good for him, and in so doing you help further the interests of one of the most important branches of the refrigeration industry.

62
A621.051
E383
SEP 6 1935
LIBRARY

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS. MEMBER PERIODICAL PUBLISHERS INSTITUTE

VOL. 16, NO. 1, SERIAL NO. 337
ISSUED EVERY WEDNESDAY

Entered as second-class matter Aug. 1, 1927

DETROIT, MICHIGAN, SEPTEMBER 4, 1935

Copyright, 1935, by Business News Pub. Co.

THREE DOLLARS PER YEAR
TEN CENTS PER COPY

15652 Units Are Sold in June by 18 Com'l. Firms

Month's Sales to Dealers Near Year's Record Set in May

DETROIT—World sales of commercial condensing units in June by manufacturers to dealers totaled 15,652 units, according to a tabulation made by the Commercial Refrigeration Section of National Electrical Manufacturers Association from reports made by 18 companies. Not all of the companies reporting are Nema members.

The tabulation includes units sold separately and those sold together with low side applications.

The June total of 15,652 units compares favorably with world sales of 16,940 commercial units reported in May, which set a monthly high for the year.

Particularly impressive in the sales of various types of commercial refrigeration equipment were sales of complete water coolers and self-contained ice cream cabinets, new monthly records being established in both classifications.

A detailed report of the June commercial sales will be found on page 2 of this issue.

Housewares Show to Feature Air Cooling

CHICAGO—To educate department store executives as to the new profit possibilities in air conditioning and pre-fabricated houses, displays in these fields will be featured at the International Housewares Show to be held Jan. 6 to 18 at the Merchandise Mart by 105 housewares manufacturers, reports T. J. Reed, general manager of the Mart.

"We believe that household equipment such as complete air-conditioning units for either a single room or an entire dwelling will be sold through department stores generally within the next five years," declared Mr. Reed.

"We also believe," he continued, "that the department stores of the country will be the logical outlets for the sale of pre-fabricated homes; and that it will be entirely possible for the consumer to walk into a store and purchase an entire home, completely furnished, equipped with air conditioning or a humidifying system, and erected on his own lot at a given price.

"We are securing the cooperation of many of the large manufacturers of air-conditioning equipment, refrigerators, bars, radios, etc. to dramatize the sales and marketing possibilities in these fields to department store executives."

Construction differences of a refrigerator made to sell at $99.50 and a unit priced at $225.00 will be illustrated. Buyers will be shown why four-coat enamel ware is better than two. Enameling and stamping machines will help demonstrate the difference.

A series of round table discussions will be held with addresses by prominent scientists, engineers, research men, and marketing experts during the two week period of the exposition, said J. P. Corley, manager of the show.

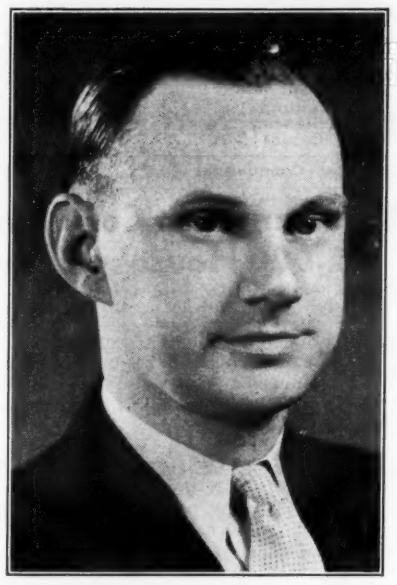
"From all indications," believes Mr. Corley, "January, 1936, will mark a crucial turning point in department store marketing of housewares and home furnishings items. Once store executives grasp the new profit possibilities in air-conditioning and prefabricated house fields, an entirely new method of selling these items to the people of America will develop."

Chryst Directs Publicity for Geyer, Cornell & Newell

NEW YORK CITY—T. L. Chryst, formerly with the Brooke, Smith & French, Inc., advertising agency of Detroit, will head the newly organized publicity department of Geyer, Cornell, and Newell, Inc., Kelvinator agency.

Mr. Chryst, a former newspaper man and Associated Press correspondent, has handled industrial publicity for the last seven years.

Paul Sowell Made Advertising Mgr. Of Leonard



PAUL D. SOWELL

* * *

DETROIT—Paul D. Sowell has been appointed advertising and sales promotion manager of the Leonard Refrigerator Co.

Mr. Sowell's career in the electric refrigeration started in 1928 when he began as a retail salesman for the Leonard distributor at Little Rock, Ark. He was successively sales supervisor, wholesale salesman, and sales manager for the distributor.

In February, 1934, Mr. Sowell joined the Leonard Refrigerator Co.'s factory sales promotion department. Later he was made assistant.

Evans Seeks Repeal of French Import Quota

DETROIT—Thomas Evans, president of Merchant & Evans Co., who stopped in Paris, France last week on a European trip, called on French officials in his capacity as chairman of the Refrigeration Division of National Electrical Manufacturers Association to seek a removal of the import quota on refrigeration equipment which the French government set up this spring.

Low Inventories Are Predicted At G-E Meeting

Fall Sales Campaign Which Opens Sept. 16 Features 'Stock Exchange'

CLEVELAND — Distributors for General Electric refrigerators in their ninth annual convention here heard the prediction that the industry will have a record low inventory at the end of 1935, and cheered the announcement that G-E will drive ahead with a Fall campaign which embraces a contest with $100,000 in cash prizes, plus the biggest fall advertising appropriation ever set aside by the specialty appliance department.

"According to present indications the industry will close this year with the lowest inventory in its history," declared P. B. Zimmerman, manager of the specialty appliance department.

"There is an increased purchasing power in the country now. These facts, coupled with the fact that fewer outlets are looking for specials, and with increased interest in the general modernization program, give us all cause for optimism in selling."

The fall sales campaign opens Sept. 16 and will be continued for eight weeks. The campaign willl be known as the "Refrigerania Stock Exchange." Salesmen, sales managers, supervisors, branch managers, wholesale contact men, utility merchandise managers, dealers and distributors all have a chance to win bonuses in the drive, stated Jean DeJen, campaign manager.

To tie up with the campaign, A. L. Scaife, advertising and sales promotion manager, promises an advertising campaign which will find G-E copy in practically every leading national magazine.

Mr. Scaife outlined a quantity of sales promotion material, direct mail, and other sales helps available for every type of sales outlet. He stressed the selling value of the technicolor motion picture, "Three Women," starring Johnny Mack Brown and other movie celebrities, and which sells the G-E kitchen idea. Already, this movie has been shown to 120,000 persons, and during the next few

(*Concluded on Page 2, Column 1*)

Buschmann Named Asst. Engineer By Brunner

OSCAR H. BUSCHMANN

* * *

UTICA, N. Y.—Oscar H. Buschmann has been appointed assistant chief engineer of the Brunner Manufacturing Co. here, reports G. L. Brunner, president of the company.

Previous to joining the Brunner organization, Mr. Buschmann had been refrigeration and designing engineer with Chrysler Corp., Detroit, and assistant chief engineer for Universal Cooler Corp., Detroit.

Pierce-Arrow Dealers To Handle Copeland In New York, Buffalo

NEW YORK CITY—Pierce-Arrow Motor Car Sales and Service in both New York City and Buffalo are now handling Copeland household and commercial refrigeration equipment.

The New York City operation has headquarters at the Pierce-Arrow showroom at Broadway and 57th St.

Heading the New York office is John D. Casey, with I. W. Pelton in charge of refrigeration sales. About 30 persons are employed in the refrigeration sales department.

H. W. Williams is in charge of refrigeration sales at the Buffalo office.

Georgia Power Sells 6,920 Refrigerators in 7 Months

ATLANTA—A total of 6,920 refrigerators were sold by the Georgia Power Co. here during the first seven months of 1935 as compared with 5,826 during the same period last year. Range sales during the first seven months of this year totaled 2,206 as against a total of 1,531 during the same months of 1934.

Anthracite Radio Sales To Distribute Crosleys

SCRANTON, Pa.—Anthracite Radio Sales Co. of this city has been named distributor for Crosley electric refrigerators and radios in the Scranton, Wilkes-Barre, and Pottsville, Pa., territory. William Schlanger is president of the company, and Roy Winters, sales manager.

Davison Leaves Kroger to Join Hussmann

ST. LOUIS—Bernard R. Davidson, refrigeration engineer formerly in charge of all refrigeration work for Kroger Grocery & Baking Co., has joined the refrigeration department of Allied Store Utilities Co., manufacturer of Hussmann-Ligonier commercial refrigerators.

Carrier Reports Profit of $25,913 for 6 Months

NEWARK—Carrier Corp. for the first six months of 1935 showed a net profit of $25,913.71. This compares with a loss of $105,117.66 for the first half of 1934 and a loss of $288,163.78 for the similar period of 1933.

Commercial Unit Rules Changed By Underwriters

Standards Altered on Motor Controls, Refrigerants & Copper Tubing

CHICAGO—Changes in the standards for refrigerants, motor controls, and copper tubing have been incorporated in the Underwriters' Laboratories 1935 "Standard for Commercial Refrigerating Systems," which supersedes the former Underwriters' commercial refrigeration standard, dated August 16, 1933.

A new paragraph has been added to the section on refrigerants, reading as follows:

"Refrigerants used in air-conditioning systems employing direct method of refrigeration shall be practically inflammable and shall be of a *lower degree of toxicity* than group 4 as defined on page 106 under 'summary' of Underwriters' Laboratories' Report MH2375, entitled 'The Comparative Life, Fire, and Explosion Hazards of Common Refrigerants.'"

(Editor's Note: Group 4 is defined in Report MH2375 as follows: "Gases or vapors which in concentration of the order of 2 to 2½ per cent for durations of exposure of the order of two hours are lethal or produce serious injury: dichlorethylene, methyl chloride, and ethyl bromide." Refrigerants in groups classified as being less toxic than group 4 are butane, carbon dioxide, ethane, Freon, F-11, F-114, and propane.)

In the section on motor protection which says that protective devices such as controllers incorporating thermal relays may have a heating element with a current rating of 140 per cent of the full load rated current, a paragraph has been added which says:

"Fuses employing the usual type of cutout base are not recognized as suitable motor-running protection. Special designs shall be subjected to test to determine their suitability."

In the section on valves and tubings, the standard for copper tubing has been elaborated and made slightly more stringent. Wall thickness specifications for hard copper pipe have been added.

Manufacturers in testing all pressure-containing parts of the system must subject them to somewhat higher pressures than were required in the 1933 standard.

Complete text of the Underwriters' Laboratories' 1935 standard will be found on page 10 of this issue.

Arco Combines Steam and Conditioning System

NEW YORK CITY—A radiator-type winter air-conditioning system for the small home, designed with separate heating and air treatment apparatus which act in harmony but are subject to independent control, has been put on the market in the West and Midwest by American Radiator Co.

Constructed for use in the $3,000 to $8,000 home, the new conditioner can be hooked into the radiator heating system, so that it will condition a six-room house from that point without duct work. It cleans the air in a home, humidifies, and circulates it, with provision for ventilation. Refrigerating coils may be installed if this is desired.

The interaction of the heating and air treatment apparatus, say American Radiator Co. officials, eliminates the need for elaborate controls, and permits a form of conditioning where the heat can be varied according to

(*Concluded on Page 6, Column 1*)

Hotton Joins Apex Staff With Offices in Detroit

DETROIT—R. F. Hotton, formerly domestic district manager for the Michigan-Indiana-Ohio-Kentucky territory for Kelvinator Corp., has joined the staff of the Apex Electrical Mfg. Co. with headquarters at 18310 Pennington Drive, Detroit.

For 16 years Mr. Hotton was connected with the Detroit Edison Co., resigning in 1926 to accept a position with Servel, Inc. as manager of Michigan branch of that organization. He joined Kelvinator in 1931.

Fargo, N.D., Survey Shows Relationship Of Incomes & Refrigeration Market

FARGO, N. D.—More and stronger evidence of the close relationship between income and the ownership of an electric refrigerator is contained in the third and most recent of five Department of Commerce surveys, covering Fargo, N. D., a city of 7,250 families.

Previous surveys studied the relation between income and consumer use of selected services in Austin, Tex., and Portland, Me. In preparation are two more studies, covering Columbia, S. C., and Salt Lake City, Utah.

Indicated in the survey is the city's electric refrigeration saturation, by income classes, and the location of the potential markets for these and other electrical appliances in the future. Home ownership, type of dwelling, type of heating apparatus, kind of fuel used for heating, cooking, and lighting, use of bathtubs or showers, and automobile ownership are also covered in the study.

The figures given for Fargo are on the basis of a survey covering 1,403 families, 21.2 per cent of the city's 1930 population of 6,612 families, and 21.3 per cent of the city's white population. No families other than white were studied, there being but 20 negro families in Fargo.

Incomes ranged from none at all to more than $15,000, but only one-half of one per cent of the families which were studied reported incomes of $7,000 or above. Slightly more than 34 per cent reported incomes ranging from nothing to $1,000 a year. More than half the families covered in the survey, however (55.4 per cent), had incomes between $1,000 and $3,000; and incomes in excess of $3,000 were reported by 10.2 per cent.

Mechanical refrigerators, the survey disclosed, are used by from 70 to 85 per cent of those families in Fargo that have incomes of $3,000 or more per year, and by 28.2 per cent of all families in the city. Sixty per cent of the homes with this type of equipment are owned by the persons who occupy them.

Less than one-eighth (11.6 per cent) of the total number of refrigerators used in Fargo are in the homes of families with incomes below $1,000 yearly. More than one-half (53.7 per cent) of the families owning this type of equipment have incomes of $2,000 or above.

As would normally be expected, the highest income group, comprised of families with $7,000 incomes or more, has the highest point of saturation—85.7 per cent. Since the number of families in this group is so small, however, it by no means takes the lead in total refrigerator consumption.

That distinction, on the basis of the actual number of refrigerators in use, is held by the group of families having incomes of between $2,000 and $3,000. This group, while only 16.8 per cent of the total population, owned 28.1 per cent of the number of refrigerators used in the city, and was 47 per cent saturated.

Next, in point of number, was the class with incomes ranging between $3,000 and $5,000. This group, 8.1 per cent of the total studied, was using 20 per cent of the refrigerators in the city. A close third, numerically, was the $1,500-$2,000 class, reporting 17.7 per cent of the city's population and 19.5 per cent of its mechanical refrigerators.

In fact, the refrigeration owners in the city are pretty well centralized in the four income classes between $1,000 and $5,000 yearly. These groups use 82.8 per cent of the number of refrigerators in use. The group between

(*Concluded on Page 3, Column 2*)

General Electric Distributors Report Increased Interest in Ranges

(*Concluded from Page 1, Column 3*)

months, it is expected, it will be shown to several million.

J. R. Poteat, range division manager, told the distributors that 95 per cent of the domestic electric meters in the country today have rates favorable to the sale of electric ranges. He pointed out that the first six months of this year showed an increase of 64 per cent in electric range sales over the same period of last year.

While the all-electric kitchen program will help the sale of electric dishwashers and ranges materially, Carl M. Snyder, manager of the dishwasher division, urged distributors to adopt a selective selling formula for individual dishwasher sales, as well. All better class homes, he said, can be classified as electric dishwasher prospects.

Distributors taking part in the discussion of range sales reported greatly increased interest in electric cookery. Phil Harrison, Newark distributor, related details of a school for cooks in order to train them and make them enthused over electric cookery.

Miss Edwina Nolan, home service director, discussed "Cooking Schools for Little Women"—girls from 8 to 14 years of age. Many of such schools have been conducted in various parts of the country by G-E outlets and have resulted in parents becoming interested in electric cookery, she said.

More than 6,000 salesmen and retailers have enrolled in the General Electric-LaSalle training courses, M. D. Grow, G-E training director, told the conventionites. This number includes some 2,400 dealers, he said, while 62 utility companies have subscribed for the training equipment. From October 1 to February 1, a special effort will be made by distributors throughout the country to have their sales organizations "go back to school."

One utility company, Mr. Grow appended, increased its production per man by 58 per cent and gave a large amount of credit to the training course. This company employs some 48 salesmen.

Prices of the G-E workshop have been reduced, the convention was told. The complete workshop now sells for as low as $86.40. Sales are expected to increase this fall, reaching a peak during the holidays when many workshops will be purchased for Christmas presents.

Separating Appliance Department

Many leading department stores of the country now are separating their major electric appliance department from the housewares department and are putting in charge men well versed in the art of specialty selling, declared Ralph C. Cameron, department store division manager.

Selling the complete electric kitchen to apartment house owners is a much easier job today, George Kobick, apartment house division manager, asserted. He pointed out that in 1934 a number of sales to apartment houses were made to insurance companies who felt the need to modernize in order to rent apartment suites. Now there is a very definite increase in apartment house construction and new builders realize the necessity of putting in complete electric kitchen equipment.

W. E. Landmesser, manager of the commercial division, told distributors that the Fort Wayne, Ind., factory now is set up to meet sales requirements quickly. He outlined the large number of commercial refrigeration markets now in existence.

Fielding Chandler, manager of the dealer division, stressed the increasing sales made by G-E dealers and touched upon the value of the sales pilot coaches by which the product is taken direct to the prospects' homes for demonstration and sale.

Impetus to the all-electric kitchen promotion was given at the convention. Manager Zimmerman stated that the electric kitchen modernization program now being organized by Edison Electric Institute, would be launched immediately.

Quinn Tells About Homes

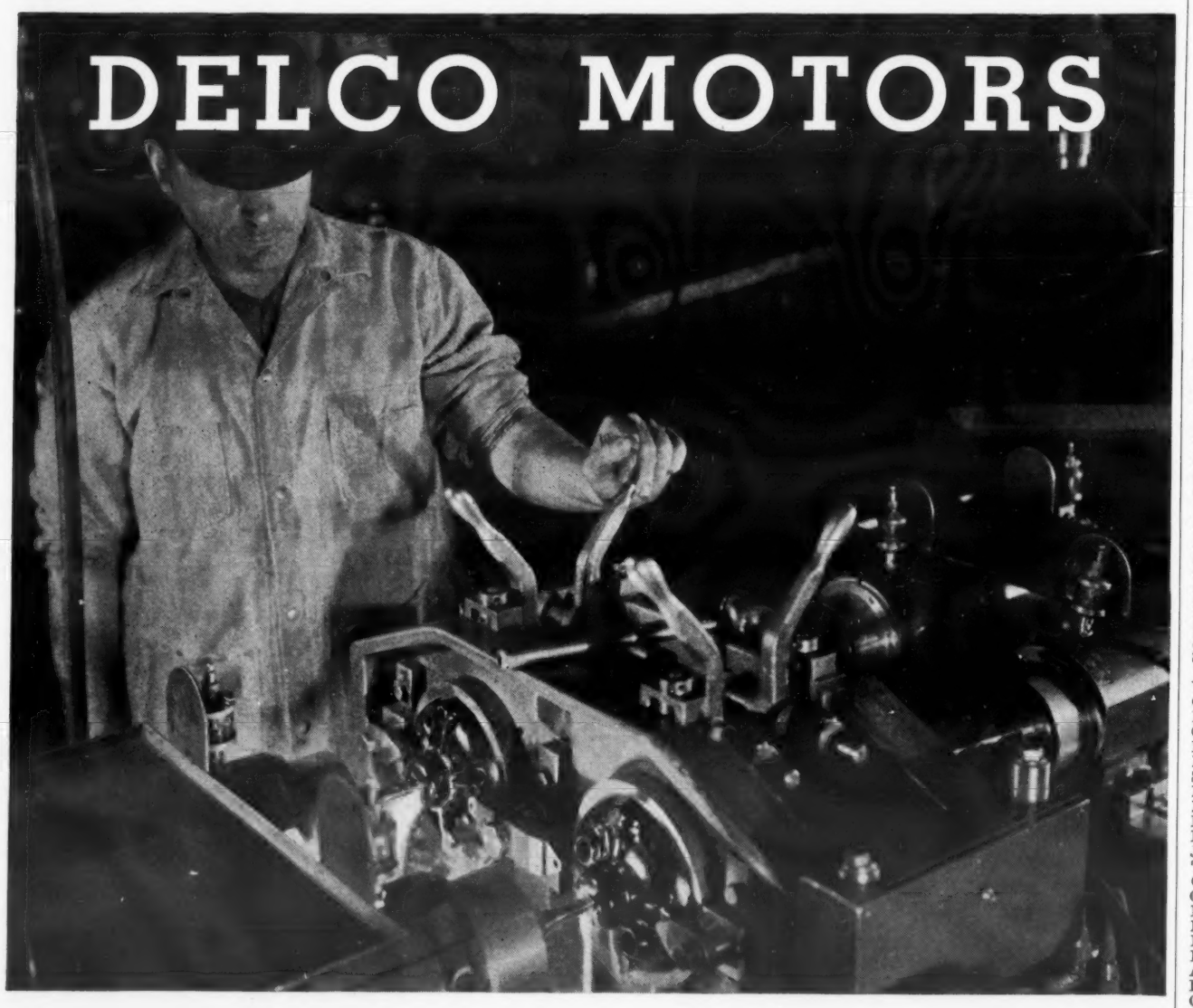
T. K. Quinn, vice president of General Electric Co. and head of the "New American" home building program sponsored by the company, described the activity as the "new science of better living."

"If you were given a mandate to bring prosperity back and to raise the standard of living in this country you could do nothing better than to build homes which are completely equipped with electrical appliances," he told the distributors.

"There is nothing more substantial, more basic, or more indispensable than homes. The 'New American' home idea, sponsored by General Electric, means building from the inside out—being sure that the modern electric home appliances, so essential to modern living, are included in the home."

Chairman of the convention, which was of the round table conference type, was A. M. Sweeney, sales manager for the department, while Paul H. Dow, assistant to the sales manager, served as manager for Nela Camp where distributors camped during the three-day gathering. A golf tournament was staged one afternoon while distributors were guests at a Cleveland-Philadelphia baseball game on the final afternoon.

DELCO MOTORS



ALL DELCO MOTORS HAVE DIAMOND BORED BEARINGS

To insure permanent quietness, a motor must have not only well lubricated bearings but also bearings which are accurately machined. The bearing surface must be smooth and the machining must be accomplished so as not to injure the crystalline structure of the bearing material. Accurate clearances must be maintained. To accomplish these objectives it is necessary that the bearings be diamond-bored—which is standard practice on all Delco motors. It is largely due to this precision operation that Delco motors are so well known for their quietness and dependability, and so widely used by manufacturers of the better household appliances.

DELCO PRODUCTS CORP., DAYTON, OHIO

Made in Canada by the McKinnon Industries, Ltd., St. Catharines, Ont.

18 Manufacturers Sell 15,652 Commercial Units to Dealers During June, 1935

Commercial sales for June, 1935, were reported to the National Electrical Manufacturers Association (Nema) by 18 companies, some of which are not members of the association. These reports cover the sale of units less than 1 hp. in size. Companies reporting are: Baker Ice Machine Co., Brunner Mfg. Co., Carbondale Machine Corp., Carrier Engineering Corp., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Phoenix Ice Machine Co., Reliance Refrigerating Machine Co., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp.

	SALES FOR JUNE, 1935					
	Domestic		Canadian		Other Foreign	
COMMERCIAL	Quantity	Value	Quantity	Value	Quantity	Value
1. Water Coolers Complete..	2,306	$ 241,445	4	$ 354	61	$ 6,429
2. Water Coolers Remote...	101	6,519	.....	.....	1	48
3. Ice Cream Cabinets Complete	2,424	252,371	83	8,542	31	4,255
4. Ice Cream Cabinets Remote	707	97,099	20	2,233	40	5,488
5. Beverage Coolers Comp..	2,855	204,749	24	1,620	45	3,103
6. Beverage Coolers Remote.	248	18,064	.....	.....	10	694
Condensing Units						
7. Less Than ⅓ Hp.....	1,215	66,579	15	985	1,057	61,098
8. ⅓ to ½ Hp. Inc.....	3,509	302,188	70	6,121	1,054	62,939
9. Above ½ and Less Than 1 Hp.	772	104,637	35	4,618	92	12,408
10. Total Lines 7, 8, and 9..	**5,496**	.....	**120**	.....	**2,203**	.....
11. Total Lines 1, 3, 5, 10...	**13,081**	.....	**231**	.....	**2,340**	.....
12. Evaporators	5,047	150,368	223	9,258	545	20,184
13. Miscellaneous Cases and Cabinets	39	8,731	4	819	4	1,163
**14. Total Commercial	.....	**$1,452,750**	.....	**$34,550**	.....	**$177,803**

First Bancredit Corp. Finances Sales of More Than 12,000 Household Refrigerators During July

ST. PAUL—Sales of more than 12,000 household electric refrigerators were financed by the 11 branches of First Bancredit Corp. and its affiliated company during July, reports L. M. Lilly, president.

Bancredit Corp., a wholly owned subsidiary of the First National Bank of St. Paul, and the First National Bank & Trust Co. of Minneapolis, has purchased more than $11,000,000 in finance paper, totaling some 40,000 accounts, during the last 12 months.

Branches of the company are located in Atlanta, Boston, Philadelphia, Chicago, Dallas, Detroit, Newark, Pittsburgh, and St. Paul, with offices of an affiliate organization, First Credit Corp., in Cincinnati and Cleveland.

In addition to serving this metropolitan territory, the company has extended its credit operations to all states east of the Rockies.

Bancredit Corp. finances acceptable dealer paper on refrigerators and other electrical appliances with no down payment, and terms as long as 36 months, under provisions of the amended Federal Housing Act.

A recent amendment to the banking bill has made FHA financing rates available alike to renters and home owners, by providing that electric refrigerators and other appliances need not be a permanent part of the property to which they are attached in order to qualify for insurance under FHA terms.

It is reported that Bancredit Corp. is setting up a permanent organization, to continue operations in the electrical appliance financing field after the passing of the FHA

Exports of Electric Refrigerators

April, 1935, Shipments Reported by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

	Electric Household Refrigerators		Electric Commercial Refrigerators Up to 1 Ton		Parts for Electric Refrigerators
	Number	Value	Number	Value	Value
Austria	65	$ 4,509	38	$ 3,336	$ 1,081
Belgium	189	18,012	329	25,483	18,551
Czechoslovakia	23	1,697	...	...	2,768
Denmark	...	...	14	1,296	3,247
Finland	...	...	...	...	2,046
France	1,587	118,092	205	24,399	24,065
Germany	58	4,890	...	...	24,718
Gibraltar	5	424	1	77	84
Greece	2	205	2	276	2,722
Irish Free State	26	1,751	145	9,829	289
Italy	50	5,333	...	...	1,389
Malta, Gozo, and Cyprus	...	...	...	...	64
Netherlands	403	27,285	156	15,121	18,624
Norway	259	21,307	42	6,331	3,967
Poland and Danzig	1	83	...	...	...
Portugal	34	2,194	7	938	515
Rumania	3	364	...	...	...
Spain	451	36,515	177	17,947	14,962
Sweden	492	34,984	62	6,168	5,632
Switzerland	201	13,538	1	256	19,128
United Kingdom	3,231	231,828	970	59,175	86,007
Yugoslavia	33	2,850	13	2,202	413
Canada	1,370	77,957	183	22,513	78,728
British Honduras	...	...	...	...	14
Guatemala	1	196	1	251	1,310
Honduras	9	566	...	...	44
Panama	60	6,909	5	689	2,250
Salvador	1	178	...	...	7
Mexico	400	34,038	19	2,181	15,016
Newfoundland and Labrador..	8	833	...	...	252
Bermuda	22	2,097	2	217	462
Barbados	13	1,209	...	...	368
Jamaica	4	434	...	...	219
Trinidad and Tobago	13	1,045	...	...	16
Other British West Indies	6	639	...	...	40
Cuba	180	16,682	4	732	2,938
Dominican Republic	8	459	...	...	17
Netherland West Indies	13	1,375	...	...	242
French West Indies	15	1,547	3	287	10
Haiti, Republic of	13	1,718	...	...	14
Argentina	9	542	80	4,458	12,921
Brazil	708	53,596	68	8,963	9,086
Chile	11	868	...	...	...
Colombia	18	1,604	...	...	242
Ecuador	43	3,499	...	...	...
British Guiana	13	1,094	...	...	...
Surinam	1	148	...	...	...
Peru	54	4,854	4	371	574
Uruguay	...	...	...	...	168
Venezuela	121	8,842	6	787	476
Aden	...	...	1	336	...
British India	229	25,336	72	6,499	8,736
British Malaya	85	7,575	12	1,168	1,651
Ceylon	133	11,398	...	...	153
China	200	19,254	34	5,017	6,782
Netherland India	320	32,109	209	20,420	4,463
French Indo-China	62	4,657	...	...	299
Hong Kong	64	5,245	12	1,018	899
Iraq	2	200	...	...	12
Japan	20	2,225	26	3,787	5,785
Kwantung	9	674	8	1,067	...
Palestine	203	14,557	55	8,493	20,475
Persia	1	110	...	...	...
Philippine Islands	121	14,269	10	2,311	2,732
Siam	20	2,452	...	...	...
Syria	28	2,641	8	1,192	411
Turkey	440	32,602	40	7,385	4,661
Australia	317	13,693	3	671	5,967
French Oceania	1	160	...	...	...
New Zealand	22	2,035	61	6,632	4,953
Belgian Congo	40	3,854	...	...	169
British East Africa	21	2,205	1	52	511
Union of South Africa	420	34,690	50	5,641	18,127
Gold Coast	3	183	...	...	116
Nigeria	...	...	...	...	127
Other British West Africa	...	...	...	...	49
Egypt	38	3,330	16	3,019	1,463
Algeria and Tunisia	637	49,087	82	8,385	8,392
Madagascar	6	597	...	...	...
Other French Africa	82	7,023	...	...	81
Italian Africa	20	1,990	...	...	...
Morocco	213	15,146	13	1,639	2,015
Mozambique	12	1,218	...	...	52
Canary Islands	30	2,606	...	...	...
Other Spanish Africa	1	125	...	...	357
Total	**14,027**	**$1,062,036**	**3,250**	**$299,015**	**$455,124**
Hawaii	516	51,168	73	9,499	10,533
Puerto Rico	500	46,131	3	647	3,437
Virgin Islands	2	242	...	...	164

Westinghouse Will Launch Fall Drive In Circus Meetings

MANSFIELD—"Ladeez and Gentulmen—watch Haidon Siku the magic master, materialize prospects out of thin air, and open locked doors without a key"—such will be the call heralding the Westinghouse fall merchandise meetings, as seven crews, each carrying four tons of circus equipment, stage distributor's meetings in the 80 leading cities of the United States.

These campaigns are to be attended by all the pageantry, color, and fanfare of circus atmosphere. Included in the equipment of the enterprises are circus and carnival backgrounds, special lighting fixtures, and merchandising displays.

Costumed in keeping with the "profession," the crew of four men, headed by a master of ceremonies from Westinghouse merchandising headquarters in Mansfield, will accompany the sideshow canvasses, circus band, pennants, balloons, and other symbols of circus-ry.

When each "barker" is introduced to his audience, he will hold forth on the merits of the new fall Westinghouse merchandise, new plans, new promotional activities, and advertising programs. Market analysis worked out to aid in the promotion and sale of various appliances, will be included in the "spiel."

Invitations, handbills, and programs, sent out to the dealer, by the jobber or distributor sponsoring the show, will proclaim each appearance.

Used to present the refrigeration story in the circus are, "Terry the Tattooed Man," "Haidon Siku," "Kitty Crusader and Alyce Ambassador."

The crews, starting on the Pacific Coast Aug. 23, will visit 80 cities, closing the carnival circuit Oct. 12 in the Southwestern District.

Ontario Electric Dealers See New Crosley Radios

BUFFALO—The Ontario Electric Co., Crosley distributor for this city, introduced the 1936 line of Crosley radios to 200 dealers and salesmen at a meeting here recently. J. L. Allen, Crosley district representative, presented the new line.

Other speakers were J. L. Block, master of ceremonies; Ernest Kronson, president of the Ontario Electric Co.; and Howard E. Richardson, sales manager, Crosley Radio Corp.

Invisible Kitchens Sold To Three Hotels

CHICAGO—Electric Invisible Kitchens have been installed throughout the suites of the Hotel Kemp, Wichita Falls, Tex., the Hotel Burlington, Burlington, Iowa, and the Mather Tower Building, Chicago.

These kitchens, says C. S. Cate, manager of the Hotel Kemp, may be installed without the expense of built-in construction, room alterations, or special wiring.

$2,000-$3,000 Group Owns Most Refrigerators In Fargo, N.D.

(*Concluded from Page 1, Column 3*)

$1,000 and $3,000 reported 62.8 per cent of this total.

Besides having the greatest number of refrigerators, the income group between $2,000 and $3,000 also was the nearest, in percentage, to the saturation of 26.8% for all classes studied.

From a comparison of the Fargo survey with those previously published regarding Austin, Tex., and Portland, Me. (ELECTRIC REFRIGERATION NEWS, July 17), it may be noted that, while Fargo has a higher percentage of saturation than either of the two others (Austin had 16.1 per cent, Portland 16.8), the figures for the three cities regarding the use by income classes are almost identical.

In all three studies, the classes between $1,000 and $5,000 showed by far the greatest percentage and number of mechanical refrigerator owners.

The figures for Fargo, studied, by saturation percentages, from the top to the bottom income classes, show variations of from 85.7 per cent, for the $7,000 or over class, to 4.7 per cent, for the group with yearly incomes between $1 and $500.

Analysis of Income Classes

Individually, the income classes stack up as follows:

$7,000 and over: 85.7 per cent ownership, or six families out of seven studied; $5,000 to $7,000: 72.7 per cent, 16 families out of 22; $3,000 to $5,000: 69.9 per cent, 79 families out of 113; $2,000 to $3,000: 47 per cent, 111 families out of 236; $1,500 to $2,000: 32.1 per cent, 77 families out of 240; $1,000 to $1,500: 19.9 per cent, 60 families out of 302; $500 to $1,000: 11.4 per cent, 30 families out of 263; $1 to $500: 4.7 per cent, eight families out of 169; "no income," 15.7 per cent, eight families out of 51.

The "no income" class bears some explanation, since members of this group report a higher percentage of refrigeration ownership than any other with income below $1,000.

Apparently this group is comprised of families whose financial status differs widely. While reporting no income for the year 1933 (and therefore of no significance as far as this study is concerned), this group is included as a necessary part of the population sample. Members of this group lived during 1934 either on savings, borrowed capital, or charity.

60.6 Per Cent Own Automobiles

Automobiles are owned by about three-fifths of all families in Fargo (60.6 per cent), but less than 2 per cent of these families have more than one car. By comparison, there are distributed among the same people slightly more than two and one-fourth times as many automobiles as mechanically-operated refrigerators.

There is no clear indication that a relationship exists between status of tenancy and ownership of a car, since tenant families (48.8 per cent of all families) constitute only about 59 per cent of the families with no automobile. When more-than-one-car status is considered, however, the picture changes. Three-fourths of the families with two or more automobiles occupy their own homes.

Fargo stands exceptionally high in the percentage of families who use electricity for lighting purposes. The figure is 99.7 per cent for all income classes. The small number who do not use electricity are in the group with incomes between $1 and $500. All families above this group use electricity exclusively.

This being true, it follows that the income class largest in point of numbers ($1,000 to $2,000 class), also contains the greatest number of homes equipped with electric-lighting facilities. (This class is 26 per cent mechanical refrigerator saturated.)

Only 0.1 per cent of the city's families use electricity for cooking, while 86.3 per cent use gas. Two families, one in the $2,000 to $3,000 class and the other in the $1,000 to $1,500 class, cook by electricity. In the other groups gas, or other fuel (presumably coal) is used. This would indicate a large potential market for electric ranges, since, as stated above, practically all the city's homes are wired.

An indication of the potential market for electric refrigerators, ranges, and other appliances may be gained from a study of the following tabulation, which lists comparative figures for the different income groups, as relates to ownership of refrigerators, one automobile, and the use of electricity for lighting:

Income Class	Percentage of Ownership: Refrigerator	Automobile	Electricity
No income	15.7	51.0	100.0
$1-$499	4.7	32.5	97.6
$500-$999	11.4	45.6	100.0
$1,000-$1,499	19.9	57.6	100.0
$1,500-$1,999	32.1	74.2	100.0
$2,000-$2,999	47.0	78.4	100.0
$3,000-$4,999	69.9	81.4	100.0
$5,000-$6,999	72.7	68.2	100.0
$7,000 and over	85.7	71.4	100.0
All Classes	28.2	60.6	99.7

Salesmen Awarded Prizes in 'Jubilee'

NEW YORK CITY—Prizes offered by Frigidaire, General Electric, Kelvinator, and Westinghouse were awarded last week to leading salesmen who participated in the recently completed Refrigeration Jubilee conducted by the Associated Gas & Electric System.

Thomas P. O'Brien, H. R. Wait Co., Auburn, N. Y., who sold 102 units with a total retail value of $17,421.00 won the Frigidaire $100 cash prize awarded to the top utility or dealer salesman selling the largest volume of Frigidaires.

The General Electric award of an X7 Monitor Top refrigerator, to be given to the top utility or dealer salesman selling the largest volume of G-E refrigerators, was won by J. W. Russell, Dover Motor, Inc., Dover, N. J., who sold 56 units with a retail value of $10,549.

James Lyons, New York State Electric & Gas Corp., Plattsburgh, N. Y., won the Kelvinator SD-7.82 refrigerator award with a total of 68 units sold.

Westinghouse Electric & Mfg. Co. awarded two DLX-78 refrigerators, one to the utility salesman and one to the dealer salesman selling the largest volume of Westinghouse refrigerators.

Utility salesman's prize for Westinghouse was won by F. C. Daniels, Louisiana Public Utilities Co., De Ridder, La., who sold 25 units. Frank Wickham, Tompkins Department Store, Tompkinsville, Staten Island, N. Y., won the Westinghouse dealer salesman prize with 71 units.

G-E Homes in Detroit Inspected by Quinn

DETROIT—Vice President T. K. Quinn of General Electric Co. led a group of G-E officials and distributors to Detroit recently to inspect the work being done on the 23 "New American Homes" under construction here.

The homes, put up as part of a program for the erection of 500 model dwellings in various parts of the country under the direction of General Electric Co., are designed from winning plans of the 9,800 submitted in G-E's recent "New American Home" competition among the nation's architects.

All the homes are electrified, with summer and winter air conditioning, complete electric kitchens, and electric laundries. Homes of this type can be built for about $5,500, Mr. Quinn said.

With Mr. Quinn in his tour of Detroit's model homes were P. B. Zimmerman, manager of G-E's specialty appliance department; George Chapman, assistant manager; S. C. Caswell, Michigan distributor; L. D. James, St. Louis; H. H. Kelly Courtwright, San Francisco; George Belsey, Los Angeles; R. Cooper, Jr., Chicago; and George Patterson, Miami, Fla.

Sparton Sales in St. Louis Triple 1934 Mark

ST. LOUIS—Sales of Sparton electric refrigerators in the St. Louis area for the first eight months of this year were three times as great as the unit volume for the corresponding period last year, claims Maurice B. Lasky, vice president of Mayflower Sales Co., Sparton distributor here.

Norge & Electrolux Dealer Moves Headquarters

ST. LOUIS—Alfred Kanter, Norge and Electrolux dealer here, has moved to a two-story building at 6301 Delmar Blvd.

New Non-Recourse Finance Plan

ANNOUNCED BY

FIRST BANCREDIT CORPORATION

(*An Insured Institution Under National Housing Act*)

Appliances—Eligible Domestic Epuipment—Includes:

Electric Refrigerators
Electric Ranges
Electric Water Heaters
Electric Washing Machines
Electric Ironers
Electric Oil Burners

of Makes Approved by Us

Terms: NO DOWN PAYMENT REQUIRED

Up to 3 Years to Pay
Minimum Monthly Payment $4.12
Minimum Discount Charge $3.50

Discount Charges as Permitted by Federal Housing Administrator Under National Housing Act

Example: Electric Refrigerator—Cash Selling Price . . . $134.00
Discount Charge 20.07
Time Selling Price $154.07

Payments $4.28 per month for 36 months.
Dealer receives $134.00 cash with no liability.

Territory covered under this plan is the entire United States east of the Rocky Mountains.

Full information from any of the offices below:

FIRST BANCREDIT CORPORATION	*1st National Bank Building, St. Paul, Minn.*
FIRST BANCREDIT CORPORATION	*Essex Building, Newark, N. J.*
FIRST BANCREDIT CORPORATION	*Insurance Exchange Building, Chicago, Ill.*
FIRST BANCREDIT CORPORATION	*Ten Pryor Street Building, Atlanta, Georgia*
FIRST BANCREDIT CORPORATION	*Gulf States Building, Dallas, Texas*
FIRST BANCREDIT CORPORATION	*Penobscot Building, Detroit, Michigan*
FIRST BANCREDIT CORPORATION	*Drexel Building, Philadelphia, Pa.*
FIRST BANCREDIT CORPORATION	*89 Broad Street, Boston, Mass.*
FIRST BANCREDIT CORPORATION	*Commonwealth Building, Pittsburgh, Pa.*
FIRST CREDIT CORPORATION	*Chamber of Comm. Bldg., Cincinnati, Ohio*
FIRST CREDIT CORPORATION	*National City Bank Bldg., Cleveland, Ohio*

SPECIALTY SELLING

Use of FHA Financing Program Boosts Belsey's Sales

LOS ANGELES—Building its late summer advertising and sales promotion campaign almost entirely around the Federal Housing Authority modernization loan program, the George Belsey Co., southern California distributor of General Electric appliances, has had one of its best years.

The program was furthered by local banking organizations getting behind the plan wholeheartedly, agreeing to take over all acceptable NHA loan contracts, and by the FHA accepting contracts on tenant installations as well as of property owners.

Beginning with a build-up in its newspaper advertising copy, the distributor also carried out the program through every salesman in the organization. Averaging 10 calls a day, salesmen were instructed to point out the advantages in buying a refrigerator on FHA terms.

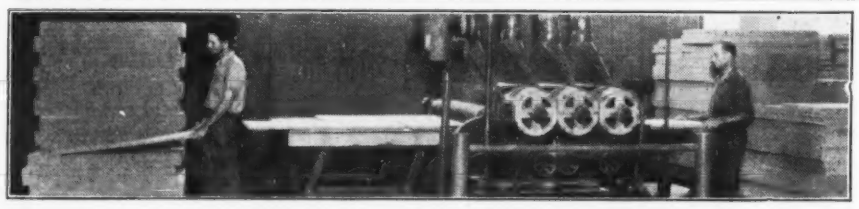
One result of the program was a larger unit sale. For example, salesmen who found it hard to turn a customer from a $195 unit to a $229.50 unit, didn't have much trouble in getting buyers to raise payments from 12 cents a day to 14 cents a day.

By the same plan it was easy to raise the unit sale on the complete electric kitchen which can be installed for as low as $12 a month, to a basis of $15 a month and up, whereas, if it is based on total net cost of equipment, or selling price complete, the resistance is far greater.

In this program, still other units were sold—that is "extra" or "plus" sales by adding a range to the electric refrigerator installation, by including both in the loan contract. Still other extra unit sales were made by helping the buyer to get a new FHA loan to pay off an old loan, say on a refrigerator already installed, and taking out a new loan to cover the purchase of an electric range, or vice versa—a plan that was ably assisted by demonstrating that savings gained would meet payments.

In one survey it was found that 90 per cent of the prospects visited, were familiar with FHA terms through previous advertisements in the varied industries, plus the information disseminated through agencies of the Housing Act. At first this applied only to metropolitan centers, but was gradually extended into the suburban districts and small towns.

In alternating advertisements which were used in the city and local papers, the idea of "savings" was stressed, not only in point of home economy, but followed department store advertising methods by headlining "bargain terms," and "save $20 on a special family size," to attract buyers into the store, after which, through a visible demonstration, most buyers decided for the purpose of ultimate economy to take a larger unit.



Sanding Celotex Boards to required thickness at the Celotex plant.

Refrigerators insulated *with*

CELOTEX

provide

CONSTANT TEMPERATURES, DEPENDABILITY AND ECONOMY

For more than twelve years Celotex Insulating Cane Board has been proving its value to manufacturers of refrigerators. This is attested by the fact that there are now millions of Celotex insulated cabinets giving satisfying service at low cost.

Here is an outline of the more important features: 1. Celotex is waterproofed. 2. Odorless. 3. Sanitary. 4. Permanent. 5. Sound absorbent in unit compartments. 6. Available pre-fabricated to your individual specifications with close dimension tolerances. 7. Fitted to minimize heat leaking cracks and joints. 8. Strong, light, easily handled. 9. Adaptable to any type cabinet. 10. All Celotex Cane Fibre Products are manufactured under the Ferox Process (patented) and therefore effectively resist damage by Fungus Growth, Dry Rot and Termites (White Ants).

We invite consultation with our refrigeration engineers. An inquiry will not obligate you.

THE CELOTEX COMPANY, 919 No. Michigan Ave., Chicago, Ill.

CELOTEX
BRAND
INSULATING CANE BOARD
Reg. U. S. Pat. Off.

BUILDS • INSULATES • DECORATES • SUBDUES NOISE

All Appliances Will Be Exhibited during Nashville Radio Show

NASHVILLE, Tenn.—The ninth annual Nashville Radio Show, to be sponsored by the *Nashville Banner* during the week of Sept. 9, will be enlarged this year to include all manner of electrical appliances, from stokers to egg beaters. Electric refrigerators and air-conditioning equipment will have a prominent part in the exhibits.

The show will not be opened to the public until Sept. 10, but a special preview for out-of-town dealers and salesmen will be held on the night of Sept. 9. These men will be guests of Nashville distributors at a barbecue dinner and special entertainment to be held in connection with the preview.

On the committee in charge of the show are: E. B. Stahlman, Jr., secretary of the *Nashville Banner*, chairman; Wheless Gambill, Jr., Gambill Distributing Co.; Joe Andrews, Keith-Simmons Co.; J. P. Lawrence, Herbrick & Lawrence; M. E. Benson, Tennessee Electric Power Co.; and Mack Rowe, Hyde & Rowe, Inc.

Other dealers and distributors interested in the affair are: Ewing Lawrence, Keith-Simmons Co.; M. E. Guttman, Tennessee Maytag Corp.; H. W. Knopp, A. H. Harned, and A. J. R. Helwig, Tennessee Valley Appliances, Inc.; H. W. Lindahl, Nashville Chair Co.; H. M. Sawrie and John W. Seay, Phillips & Buttorff Mfg. Co.; C. P. Holt, Harley Holt Co.; Walter Bracey, Nashville Furniture Co.; R. A. Coleman, Cain-Sloan Co.; E. P. Nixon, Tennessee Electric Power Co.; C. P. Dunning, General Electric Supply Corp.; Manuel Frank, Frank Coal Co.; B. A. Gilliland, Sterchi Bros. Stores, Inc.; L. T. Hudson, McWhorter-Weaver Co.; and Ben S. Gambill, Braid Electric Co.

Kenosha Dealer Gets Prospect Seated and Then Starts Talking

KENOSHA, Wis.—When a woman prospect enters the Wisconsin Electrical Supply Co., here, she is always offered a chair close to a refrigerator. This method of supplying a place where the prospect may rest while she hears the sales presentation, has proved a successful sale getter, states E. Thomas, of this concern.

"We have found that the average woman prospect doesn't like to remain in a store longer than about 20 minutes unless she can sit down," says Mr. Thomas.

"When the prospect is tired, her attention lags, but if she can rest comfortably, we can usually keep her here an hour or more, in which time a salesman can stress a great number of selling points."

Contest on 'Relics' Nets Dealer 163 Names

UKIAN, Calif.—Holders of a two dollar Continental currency bill of 1776, a telegram dated 1867, a coin from the reign of Maximus II 305-307 A.D., and the oldest Leonard refrigerator advertisement from Good Housekeeping magazine of 1908—these persons received prizes in the "oldest article in Mendocino County" contest held by the Pioneer Oil & Burner Co., Leonard dealer here.

From 163 persons, 385 entries were submitted. Other entries which merited prizes included: a copy of the Mendocino Herald, first paper published in the county dated 1861, and a deed for the sale of a negro slave, dated 1861.

W. A. Dear, manager of the Pioneer Co., states that this contest was the best promotional scheme he has ever used, because of the large number of prospects it brought into his store.

Atwater Kent Featured In Du Pont Display

ATLANTIC CITY, N. J.—Featured in a recent boardwalk window display of the Du Pont exhibit here were two Atwater Kent electric refrigerators.

In the background of the window display was a 7-cu. ft. refrigerator equipped with artificial food and in operation for visitors to examine.

Normal Temperature of 120 Doesn't Stop Dealer

WASCO, Calif.—Normal summer temperatures of 120° F. do not "cramp the style" of Mike Walsh, proprietor of the Walsh Furniture Exchange here, when it comes to selling electric refrigerators.

In this town of 700 and surrounding territory, Mr. Walsh sold 112 Leonard refrigerators in the first six months of this year as compared with 147 units sold during the whole of 1934.

Sales Contests & How to Run Them

NO. 55—SALES MANAGER CHALLENGES SALESMEN TO DO BETTER THAN HE CAN IN A WEEK OF SELLING

By John Kumler

Show us the salesman who doesn't think that as good or as poor as he is—the boss couldn't do any better! What a snap the boss has! Couldn't do any better himself!

Could you?—the boss do it? How's your nerve? And will your "dogs" stand it?

George Lee, sales manager of the Todd Co. (check protector division), decided to give his salesmen who thought he "couldn't do so durn well himself" a chance to check up on their views.

He challenged any and all salesmen to outsell him for a week—and he agreed to go out on territory unheralded and unsung and outsell them. It was strictly on the level.

He agreed to pay any salesman $100 out of his own pocket, who outsold him that week.

Tucking a check protector under his arm and his chin out, he hied back to his first love—the territory where he got his start years before. And blamed if he didn't unload 22 machines.

One salesman tied him during this challenge week and as a result of that week of concentrated effort, all sorts of records began to go by the board. You see some of the salesmen forgot to quit at 4:30 (you can't see anyone after 4:30 you know) and found they could sell at any and all hours.

Mr. Lee was so delighted that he gave five lesser prizes as well as a main prize.

'Back-Door' Canvassing Follows Handbill Distribution; Ups Pearson's Sales 50%

INDIANAPOLIS—Back door solicitation carried electric refrigerator sales of the Pearson Co., Inc. of this city to an increase of 50 per cent over the sales made during the corresponding period of August last year.

That the ordinary eeny-meeny-miny-mo method of house canvassing would not serve to clear the store floor space of an overstock of models, nor help to maintain the desirable quota of sales of this year's models, became evident to Benjamin V. Hinshaw, manager. To right things; he adopted a system of selling by schedule.

Mr. Hinshaw and the salesmen mapped out the number of calls possible to make in a given territory during the hours between 8 a. m. and noon. No afternoon canvasses were tabulated.

With the allotted territory charted, a deliveryman from the store took a handbill advertising refrigerators sold by this company to every home in the area to be canvassed the following morning. He gave these small advertisements to the housewife, or fastened them to the door knobs.

To differentiate this company's salesmen from the average salesmen who call at the front door, and to enable the men more quickly to put across the household economy involved in the purchase of refrigerators, salesmen were required to do back door canvassing.

When the prospect opened her door, the salesman presented her with a duplicate of the handbill. This frequently served almost as an Open Sesame, and was often met with the answer: "Oh yes, you are the refrigerator man from Pearson's."

Printed on the handbill was a description of the conveniences and economies of the refrigerator. The salesmen reiterated these facts and made them more concrete by quoting various savings made possible through quantity buying, when the housewife had an electric refrigerator installed in her home.

"An average of one out of eight women interviewed in this manner purchased an electric refrigerator," says Mr. Hinshaw. "Our plan cleaned up our abnormally heavy overstock of refrigerators left over from last season, and added a nice increase in sales to this year's shipment."

Many store appointments for demonstrations, were made, and the salesmen drove prospects to the store. Frequently the prospective customer preferred to pay cash through the facilities of the FHA loan plan. Mr. Hinshaw handled all preliminary arrangements necessary for making application, for those desirous of using this plan.

"Our timed delivery of handbills and the appearance of the salesman at the back door when the housewife was in a receptive mood, formed the combination that was responsible for our heavy turnover in overstocks, and in new models, during a normally slow selling period," says Mr. Hinshaw.

Lappin Lists Winners in Milwaukee Contest For Salesmen

MILWAUKEE—Gerald D. Lappin, promotion manager, Lappin Electric Co., Crosley distributor here, has just announced that winners in that company's contest for dealers' salesmen, which ended July 31, are as follows: first prize, $100, E. Segall, Gimbel Bros.; second prize, $50, S Kishner, Atlas Radio Co.; third prize, $25, J. Fleming, Seidel Bros.; fourth prize, $15, D. Pasch, Pasch Radio Stores; fifth prize duplicated to H. A. Fuge, Fuge's, West Bend, and J. Slusser, Van's Hardware Co., Green Bay, Wis.

The PRODUCT
The ABILITY
The EXPERIENCE
SELL
MODEL VA 2 H.P
AIR-COOLED UNIT
Copeland
and You'll Close
MORE JOBS!
30
Commercial
MODELS
COPELAND Commercial Refrigeration stands upon its own performance record—an enviable one. Thousands of completely satisfied Copeland owners testify to acknowledged superiority of Copeland design and built-in quality. Every Copeland unit is produced to do a definite job efficiently and economically and to stand up under constant usage for years. Sell Copeland and you will be selling a type of performance that every buyer expects but quite often does not get. A few territories available.
COPELAND REFRIGERATION CORP.
Manufacturers of a Complete line of Household and Commercial Refrigeration
Holden Ave. at Lincoln . . . DETROIT, MICH.
Copeland
DEPENDABLE Electric REFRIGERATION

SPECIALTY SELLING

Sales Idea of the Week

By V. E. Vining, Director of Department Store Sales, Westinghouse Electric & Mfg. Co.

Here's one for the boss.

The Bible tells how to get a prospect. It says right out plain, "Seek and Ye shall find."

The whole idea seems to be built around the verb "seek." Verbs denote action.

There seems to be no Biblical authority for the story about the Strong-Silent-Mouse-Trap Man from the big woods.

In plain English—if you have something to sell—tell the world about it.

If you really have a worthwhile proposition—buy your advertising man a new pencil, a pot of paste, and some white space.

Send your salesmen out with the idea that there is nothing mysterious about this thing of prospect getting. If one man in a hundred is interested in what you have to sell, it's a cinch to find that man—all you have to do is ask the first hundred men you meet, and you can't help but find him.

Ask the butcher, the baker, the motorman, the doctor—ask 'em all.

Take 'em as they come.

The peanut man with his whistle is a salesman in the elemental.

Did you ever see a bankruptcy sign on a peanut stand?

'Ganging Up' Three Appliances on FHA Plan Builds Dealer's Dollar Volume

NEW HAVEN, Conn.—"Ganging up" three major appliances in a suggested unit purchase under the FHA loan plan has enabled the appliance department of the H. M. Bullard Co., New Haven furniture store, to build mid-summer sales of refrigerators and other household aids, relates C. F. Shelton, department manager.

The combination usually suggested is that of an electric refrigerator, a washer, and a range. With no down payment and three years on instalments, the financing arrangement appeals to many prospects whose credit will stand investigation by the bank.

By hammering continually in newspaper space, the Bullard appliance department has developed summer sales to a highly satisfactory degree, Mr. Shelton declares.

Relaxation of requirements on appliance sales made under the FHA plan has greatly aided this method of merchandising, Mr. Shelton said, particularly because families living in leased quarters can now take advantage of the government program as well as home owners.

Refrigerators can be sold at this season in combination with two other appliances of non-seasonal nature more easily than as a single item he believes.

In many cases a prospect brought to the store by a newspaper advertisement can be sold an expensive refrigerator, such as one of 12-cu. ft. capacity, instead of a small box and two other appliances. Due to the wide range of credit available under FHA, the combination can be varied greatly.

Promotion Built on Mechanical Features Plus Owner's Club Plan Doubles Unit Sales

MOBILE, Ala.—Strict adherence to the primary principles of salesmanship and a sales promotion campaign based on the reputation of the manufacturer and their own name are among the things that have enabled the Adam Glass & Co. to double its entire year's quota of Westinghouse refrigerators in six months of this year.

This policy is not aimed to develop a quick profit recovery, but planned to keep the company in the business for many years to come, says S. N. Roche of the company's electric department.

Adam Glass & Co., Inc., makes sales without benefit of costly prizes and premiums, trade-in allowances on old ice-boxes, or reductions on demonstrator models, declares Mr. Roche. Each sale must have a minimum down payment of $10.00.

Tying in with this sales policy is the dignified, straightforward advertising campaign being run in local papers. Each of a series of advertisements set up seven reasons why "Mobilians have brought more than twice as many Westinghouse models since January 1, than during any year in the company's history." Principal reasons stressed are mechanical features of the Westinghouse line.

Of special interest was the advertisement announcing that the "Rebel," the South's first stream-lined air-conditioned train, operated by the Gulf, Mobile & Northern Railroad, was equipped throughout by Westinghouse.

In addition to these promotional methods, the company is also turning all efforts toward a concentrated use of the Club Owner plan book. A check of the records since January 1, shows that 38 per cent of the sales made since that date have been through the use of this book.

Georgia Power Co.'s Sale of Appliances on 'Arkwright Day' Totalled $201,837

ATLANTA—Establishing a new high record in electric appliance sales for one day, employees and salesmen of the Georgia Power Co., Kelvinator dealer, on Aug. 2 sold $201,837 worth of merchandise, including 759 electric refrigerators, 370 electric ranges, 177 water heaters, and $33,547 of Commercial refrigeration equipment.

The one-day sales contest was held to honor P. S. Arkwright, president of the Georgia Power Co., and approximately 75 per cent of the 4,000 employees reported sales of appliances.

"Arkwright Day" which was part of the power company's "Million-Dollar Sales Circus" to increase use of electricity through appliance sales, began at six in the morning and ended at 11 o'clock that night.

Reports from the six division headquarters were telephoned to Atlanta at the close of the day and later, Mr. Arkwright spoke over a local radio station to employees throughout the state, congratulating the winners. Others who spoke on the radio program were: C. A. Collier, vice president in charge of sales; O. M. Jackson, merchandise manager, and W. B. Farnsworth, assistant merchandise manager.

Leading division for the day was Rome, under T. S. Sloan, division manager, and F. J. Dodd, division sales supervisor, with 106 per cent of its August quota. Leading store and district managers were: G. B. Starnes, Rome; C. W. King, Tifton; O. C. Hubert, Inman Park; J. A. Garner, Jonesboro; J. R. Vansant, Statesboro, and C. D. Young, Gainesville.

Individual salesmen who led in sales included: Haynes Wicker, Ringgold; T. B. Johnson, Columbus; H. H. Everett, Atlanta; Sam Baker, Brunswick; H. F. Snider, August, and Grady Good, Gainesville. Leading local managers were J. W. Howell, Jasper; W. E. Hollingsworth, Ocilla; R. E. Rainey, Mount Vernon; G. C. Walden, Swainsboro; and L. J. Porter, Greensboro.

Krich Advertises Air-Conditioning System Installed in Store

NEWARK—A variation of the "using the user" method of selling was utilized by Krich-Radisco, Inc., Kelvinator distributor here, in publicizing an air-conditioning installation made for Wiss, noted jeweler. The store is located in the heart of the business section of Newark.

At the top of the advertisement is a picture showing a full length view of the jewelry store. Copy below the picture urges the reader to visit the Wiss store to see how cool, clean, and comfortable air conditioning can make a store, office, or home.

"If you are contemplating air conditioning in your place of business or your home," reads the advertisement, "the Kelvinator installation in the Wiss store is more convincing than mere claims."

Ohio & Kentucky Crosley Dealers Cooperate in Cooking School

CINCINNATI—A combined food show and cooking school was held at Zoo Eden Park here Aug. 20 to Sept. 2, under the joint sponsorship of the Crosley Distributing Corp., dealers in southern Ohio and northern Kentucky, the Cincinnati Times-Star, and the Union Gas & Electric Co.

The cooking school was under the direction of Miss Laura Judd Bryant, home service director of the Union Gas & Electric Co. On Aug. 28, Kentucky Day, Crosley dealers in Covington and Newport gave away a $100 console radio.

Specifications Data Used to Teach Salesmen Fine Points about Product They Sell

ST. LOUIS—By teaching dealers and salesmen to know all the facts, not only about their competitors' products, but about their own product as well, Brown Supply Co., Grunow refrigerator distributor here, increased its business during the time it was supposed to be falling off, and lengthened its selling season by several weeks.

Fred A. Wiebe, vice president and sales manager, is a firm believer in the education of dealers, their salesmen, and distributors' salesmen, in all phases of their own as well as competitive machines.

Using the issues of ELECTRIC REFRIGERATION NEWS which contained specifications of household electric refrigerators, Mr. Wiebe made up mimeographed data books, including all information on the various refrigerators being sold in his territory.

Intended primarily as a primer for salesmen, to show them how Grunow compared, in construction and price, with other refrigerators on the market, the data was also useful to salesmen in getting the Grunow story across to prospects.

An interesting feature of the plan, says Mr. Wiebe, is that it indicated how little many of his own salesmen knew about their own product. After they had assimilated the information in the data book, however, their selling efficiency increased, and the sales peak was carried considerably past its usual summer mark.

Listed on Brown Supply Co.'s information sheets were model, net capacity, shelf area, number of ice trays, size of motor, type of refrigeration control, weight, list price, refrigerant, insulation, and exterior finish.

Nestor Offers Dealers Trip to Norge Convention For Late Summer & Early Fall Sales

JACKSONVILLE, Fla.—Norge Nestor Co., Inc. has inaugurated a "Nestor 'Quota Busters' Caravan" as a sales stimulator in the late summer and early fall. Winners will be sent to the Norge distributors' convention in Detroit, the second week of January.

Trips will be awarded on a mileage basis. Railroad mileage from Jacksonville to Detroit, via Chicago and Muskegon, is about 1,500 miles. As soon as each dealer achieves his quota on refrigerators, he will receive credit for one-half the distance—750 miles.

After the quota is made, all Norge products purchased before December 31, 1935, will count for a certain number of additional miles as specified in the mileage schedule set by the distributor company.

As soon as the necessary additional 750 miles, making a total of 1,500, have been earned, each dealer will be entitled to send one representative on the trip. Aftr that, every additional 750 miles will earn the same trip for another salesman or dealer representative, that is, if 2,250 miles are earned after quota is made, three members of the dealer organization may make the trip.

Field men of the distributing company will aid dealers in working out mileage schedules for their retail salesmen.

Porcelain Enamel Institute, Inc.
612 North Michigan Avenue
Chicago, Illinois

Send me a FREE copy of your new Sales Manual for Porcelain Enamel.

Name_____

Firm_____

Address_____

ERN 9-35

Send for this new Sales Manual

● Send for a FREE copy of this new Sales Manual for Porcelain Enamel . . . *right now.*

Regardless of what product or appliance you sell, this brand new book will give you selling facts, sales help, sales information you can use to advantage on every customer.

Profusely illustrated, it shows how porcelain enamel is made—how it is applied—how it is tested and proved. It answers perplexing questions; gives practical, *specific* selling points on every major appliance or product.

Send for a copy—NOW—before you forget it.

PORCELAIN ENAMEL

EDUCATIONAL BUREAU
Clearing House for Sales and Technical Information
PORCELAIN ENAMEL INSTITUTE, Inc.
612 North Michigan Avenue
CHICAGO

PORCELAIN ENAMEL THE Lifetime Finish

AIR CONDITIONING

Arco Sells Combined Steam Heating & Air-Conditioning System

(*Concluded from Page 1, Column 5*)

outside weather conditions, while a constant supply of filtered and humidified air is fed into the house.

The air supply need not be turned off in order to decrease the heat supply on a mild day. Elimination of the heat load from the air treatment system also eliminates the need for duck work.

In its simplest form, the unit can be hung from the basement ceiling, and hooked into a radiator heating supply line, with an outlet through the floor above and a return register at a distant point in the house.

Only a water supply and drain connection are needed in addition to the heat connection for the tempering coil that prevents drafts when the unit is used to bring in outside air in winter. The unit can be hooked in anywhere on a steam or hot water supply line of a radiator system. This type of conditioning makes it possible to provide both convected and radiant heat.

Sale and installation of the systems will be handled by radiator heating contractors, at a price said by American Radiator officials to be little more than half the cost of the average electric refrigerator. The heating system may be sold first, and the conditioning apparatus added later if desired, company officials pointed out.

Servel Conditions Room In Evansville Hotel

EVANSVILLE, Ind. — The new $40,000 Coral Room of the Hotel McCurdy here has been completely air conditioned by Servel, Inc. Equipment installed consists of two 10-ton machine units supplying 20 tons of refrigeration, connected to two large conditioning units.

One conditioning unit handles 5,000 c.f.m. of recirculated air, and the other 3,000 c.f.m. of fresh air. The total of 8,000 c.f.m. provides a complete change every four minutes.

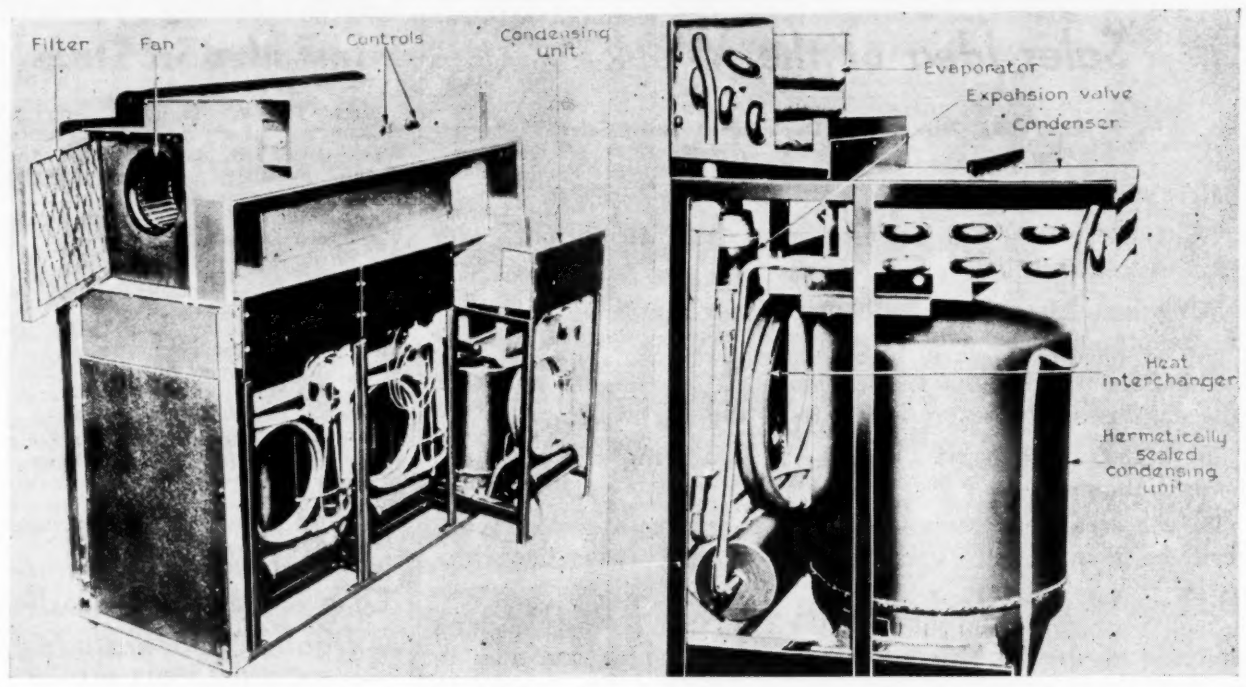
In the winter, the air-conditioning system provides for heating, humidifying, and cleaning the air. The system is controlled in the summer by compensating thermostats, and in the winter by room thermostats.

A circular bar has been installed in the new cocktail room by the St. Louis Bar Fixture Co. F. Harold van Orman, owner of the hotel, timed completion of the Coral Room so that he might have it ready for guests attending the annual Dade Park race meet during August.

New Miami Restaurant Is Air Conditioned

MIAMI, Fla.—Domestic Refrigeration, Inc., Frigidaire distributor for the Miami territory, recently completed installation of a commercial refrigeration system and a unit-type air-conditioning system for Brady's, new restaurant here.

How G-E Portable Conditioner Operates



Basic element of General Electric's new portable self-contained air conditioner is a compressor unit (illustrated at right) similar to, but larger than, the compressor used in the G-E Monitor Top refrigerator. In the same framework which holds the compressor is mounted the evaporator or cooling coil and just above the compressor, the air-cooled condenser.

All refrigerant connections to the evaporator and condenser, including the expansion valve and heat interchanger, are made at the factory and the charge of Freon and oil is sealed at the factory.

There are three of these compressor units in the new model and they slide into the lower part of the main cabinet (as shown in the left illustration). The electrical connection runs to a terminal board in the top of the cabinet.

The upper part of the cabinet houses the fans, filters, control switches, and window duct connection. After the compressors are moved into place the cabinet enclosure is slipped on.

There are two sets of fans in the cabinet, driven by a single motor. One set recirculates air from the room, brings in outdoor air from the window duct, sends the mixture of ventilation and recirculated air through filters, over the evaporator coils, and out into the room. The other set brings in outdoor air through the window duct, through filters, over the condenser coils, over the drip pan which collects condensate from the evaporators, and sends this heated, moisture-laden condenser air back out through the window duct. This action of heating the condenser cooling air and sending it over the drip pans evaporates the condensate and is said to eliminate the need for a drain connection.

When the control switch in the upper front part of the cabinet is turned to "cooling" the fans begin to operate and as soon as they have reached full speed, an automatic control starts compressor unit No. 1, and as soon as the latter has attained full speed, compressor No. 2 starts automatically, and similarly with compressor unit No. 3, thus eliminating heavy inrush of starting current.

Announcing —

THE MASTER SERVICE MANUAL

(To be published on or about Jan. 1, 1936)

In answer to the need for more complete and correlated service information on refrigeration and air conditioning, as shown by numerous requests, the Business News Publishing Co. announces the preparation of the MASTER SERVICE MANUAL.

This volume will consist principally of the series of articles by K. M. Newcum published in the weekly issues of ELECTRIC REFRIGERATION NEWS beginning April 10, 1935. supplemented by additional related material. It will make available to installation and service men detailed information on the design and operation of present-day refrigeration systems.

Not only will this manual fill the definite need of a textbook for the service schools, but it will provide the practical service man with a handbook, to assist in meeting the specific problems which come up daily in servicing operations in the field. Every enterprising service man will want this manual to read and keep for reference. Manufacturers, distributors, jobbers, and dealers will find this book highly useful in training new employees.

Advance Order Price $3.00 per Copy

Master Service Manual Order

Date.....

BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.

☐ Please enter my advance order for the MASTER SERVICE MANUAL, and send me reprints (in pamphlet form) of the first six chapters as published in the weekly issues of Electric Refrigeration News from April 10 to Aug. 21, 1935. Enclosed is $3.00.

☐ Please enter my subscription to ELECTRIC REFRIGERATION NEWS to start with the issue of Aug. 28, 1935, and send me reprints (in pamphlet form) of the first six chapters of the MASTER SERVICE MANUAL as pubished in previous issues of the NEWS. Enclosed is $3.00. I understand that this does NOT entitle me to the **complete book** or **reprints** of future chapters to appear in the NEWS.

Name.....

Attention or In care of .....

Street.....

City.....State.....

Remarks.....

.....
(Please indicate products sold or principal line of business.)
9-4-35

FOR IMMEDIATE USE

Many requests have come in for back issues of ELECTRIC REFRIGERATION NEWS containing all of Mr. Newcum's articles published up to the present time. In response to this immediate need, the Business News Publishing Co. offers the following propositions.

(1) Send in your advance order for the MASTER SERVICE MANUAL, enclosing $3.00 to pay for the complete book, when published, and we will send you free of charge, reprints of all the Newcum articles published in the NEWS through Chapter 6 (in pamphlet form; book size).

(2) Send $3.00 for a year's subscription to ELECTRIC REFRIGERATION NEWS to start with the issue of Aug. 28, 1935, and we will send reprints (in pamphlet form; book size) of all the Newcum articles through Chapter 6 published in previous issues of the NEWS.

Business News Publishing Co.
5229 Cass Ave., Detroit

'Push-Button' Control Used in Restaurant

CHICAGO—Sally's Restaurant, in Uptown Chicago, has completely air conditioned its main dining room, cocktail bar, and cafe. Installation was designed and installed by the Kroeschell Engineering Co. here.

Due to lack of space, the air-conditioning apparatus was located in a special housing on the roof. Two large, motor-driven Freon refrigerating units are located in the basement. Conditioned air is introduced at the ceiling. All ducts are concealed. The apparatus is controlled by push buttons placed inside the restaurant at convenient points.

Questions on Coolrest Answered by Crosley

CINCINNATI—"Sleep in cool, healthful comfort" reads the newest piece of promotional literature on the Crosley Coolrest air-conditioned bed canopy, now being distributed among its dealers by Crosley Radio Corp.

The poster may be hung on dealers' walls or in their show windows. In addition to listing the two models now available, and explaining their features, the experience of several users is also detailed, together with their testimonials of how the Coolrest enabled them to obtain relief from asthma, hay fever, and other respiratory ailments, besides giving them a comfortable night's rest during the hot weather.

An interesting feature of the poster is a list of answers to questions commonly asked about the Coolrest. Some of these questions, and their answers, are:

"Can the Coolrest be made any more attractive in appearance?

"Yes. Cretonne or other material . . . may be made up and substituted for the neutral shade of covering supplied as standard equipment.

"Is it noisy?

"It makes less noise than an electric fan. The monotony of this sound tends to promote sleep rather than prevent it . . . tends to subdue street and traffic noises and other extraneous sounds that migh prevent sleep.

"How is fresh air introduced into the canopy?

"Through the pores of the fabric material out of which the canopy is made. . . . The blowing of the stream of cool air against the top of the tent tends to force air out that is in the tent, which is replaced by fresh air that seeps through other parts of the canopy. An adjustable ventilator is provided, which permits additional air of desired quantity to be drawn into the air stream to satisfy those who feel that insufficient air will seep through the canopy.

"What becomes of moisture?

"Moisture condenses on the cold evaporator in the air stream, and is conducted by copper tubing to pan-like fins on the condenser. Air blowing through the condenser dissipates the heat removed from the canopied compartment, and is blown outside into the room."

Wasps to Fight Bollworm Brought from Egypt in Air-Conditioned Liners

PRESIDIO, Tex.—Air conditioning, air express, and modern, fast liners are making possible the shipment of wasps from Egypt to the U. S. Government agricultural station here, to be used in waging war on the pink bollworm invading American cotton fields.

Efforts to bring this particular type of wasp into the country have failed in the past, because the insects could not stand the long, hard journey by the usual methods of transportation.

After being obtained by scientists of the Egyptian Ministry of Agriculture, the wasps are packed in special containers for shipment.

The containers are placed in air-conditioned rooms on fast ocean liners, and, upon arrival in New York City, are rushed by air express to the government station here.

Carrier Engineers Devise 'Econograph' for Calculating Profit Accrueing from Office Building Installation

NEWARK—For the scientific determination of the yield or profit to accrue from the installation of air conditioning in an office building under given conditions, two young Carrier Corp. engineers have developed an ingenious graphic method which they call the "Econograph."

The "Econograph" is a chart on which may be plotted the present known and anticipated factors of the rental situation and the estimated annual cost of owning and operating an air-conditioning system. The result read directly from a scale shows the yield or profit from the system under those conditions.

Supplementary to the chart is a set of tables indicating the annual owning and operating charge under various conditions of location, size, shape, and height of building, and unit cost of electric power and water.

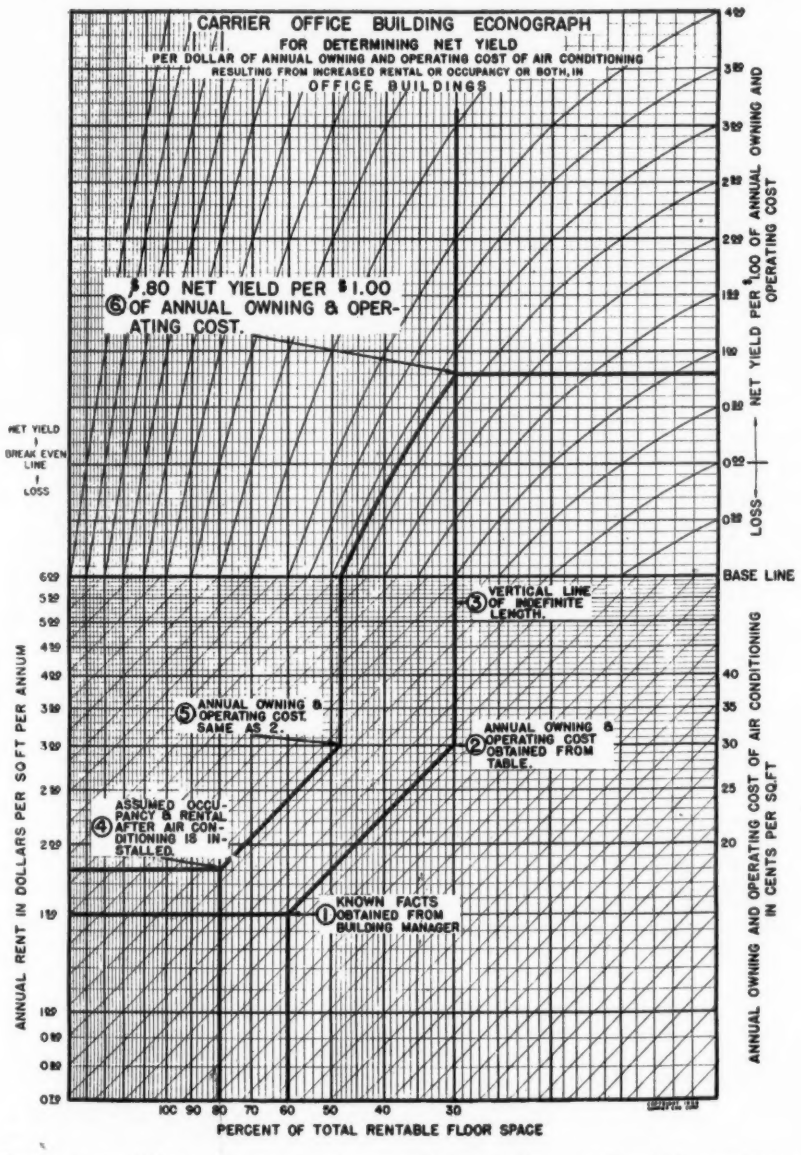
By selecting from these tables the operating cost figure most nearly applicable to his building, and having in mind the known facts as to the present rental situation and an estimate of probable change, the building owner may plot the approximate profit he can reasonably expect from investing in air conditioning.

The engineering tables are based on dividing the country into four cooling zones. They include calculations for seven different shapes of buildings. These calculations indicate annual owning and operating costs for an air-conditioning system of from 20 cents to 33 cents per sq. ft. per year, with variation factors depending on power and water cost, and height of the building.

The accompanying illustrations show the tables, and a sample calculation worked out on the chart.

C. F. Hill and E. V. Erickson, junior engineers of the Carrier organization, working under the direction of L. L. Lewis, chief engineer, are credited with the development of the "Econograph" chart.

Chart on Which Profit Is Figured


CARRIER OFFICE BUILDING ECONOGRAPH
FOR DETERMINING NET YIELD
PER DOLLAR OF ANNUAL OWNING AND OPERATING COST OF AIR CONDITIONING RESULTING FROM INCREASED RENTAL OR OCCUPANCY OR BOTH, IN OFFICE BUILDINGS
$.80 NET YIELD PER $1.00 OF ANNUAL OWNING & OPERATING COST.
NET YIELD PER $1.00 OF ANNUAL OWNING AND OPERATING COST
NET YIELD OR BREAK EVEN LINE OR LOSS
LOSS
BASE LINE
VERTICAL LINE OF INDEFINITE LENGTH.
ANNUAL OWNING & OPERATING COST SAME AS 2.
ANNUAL OWNING & OPERATING COST OBTAINED FROM TABLE.
ASSUMED OCCUPANCY & RENTAL AFTER AIR CONDITIONING IS INSTALLED.
KNOWN FACTS OBTAINED FROM BUILDING MANAGER
ANNUAL RENT IN DOLLARS PER SQ FT PER ANNUM
ANNUAL OWNING AND OPERATING COST OF AIR CONDITIONING IN CENTS PER SQ FT
PERCENT OF TOTAL RENTABLE FLOOR SPACE

Present conditions—60 per cent occupancy, average rental rate $1.50/sq. ft./yr. Assume size of building and power plus water costs to be such as to result, from calculations made from the table, in an estimated annual owning and operating cost of 30 cents/sq. ft./yr.

Select point 60 (per cent of current occupancy) on bottom scale, and erect vertical to $1.50 line (present rental rate) scaled on left of chart. This is point "1" on illustration.

Follow diagonal lines on chart to 30 cent line (estimated owning and operating cost) scaled on the right side of the chart. This is point "2" on the illustration. Draw a vertical line (3) from this intersection indefinitely upward.

Assuming an anticipated increase in occupancy to 80 per cent and increased rental rate to $1.80—find profit from air-conditioning system.

Select point 80 on bottom scale and erect vertical to $1.80 line scaled on left of chart, which results in point "4". Follow diagonal to 30-cent line to reach point "5". Draw vertical line from this point to base line.

Then follow curve to intersection with previously drawn vertical and read result of 80-cent net yield per $1 of annual owning and operating cost, scaled on the upper right side of the chart.

This means that for every dollar spent in the annual owning and operating cost of the air-conditioning system there will be available 80 cents for other building operations.

The chart can also be used to determine the new rental rate and occupancy necessary to return the annual owning and operating charges, without extra profit.

Calculations are started off in the same manner as explained above, until point "2" is reached. From point "2" a vertical line is erected to the breakeven line (0.00) scaled on the upper right of chart.

From this intersection, the curve is followed down to the base line, and from the intersection where the curve meets the base line, a vertical line is dropped to the 30-cent line.

A diagonal line of indefinite length is then drawn through this intresection. Any point along this diagonal line, representing combinations of occupancy and rental rate, will provide sufficient money to pay annual owning and operating charges.

★★★★★★★★★★★★★★★★★★★

WE HAVE BEEN TRAINING MEN FOR 18 YEARS!

WE have trained more than 100,000 men for technical positions of many kinds. Therefore training men for Refrigeration and Air Conditioning work is right up our alley.

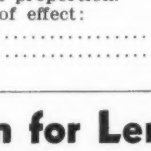
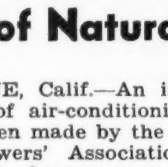
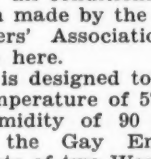
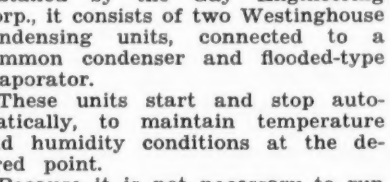
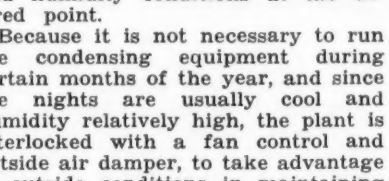
We have the experience—the facilities—the cooperation of the industry—and offer a most unusual course of combined home-study and shop training to ambitious men who want to rise above the crowd and go places in this big new field.

R-A-C-I Training is supervised by some of the industry's own engineers, appointed for that purpose. It is officially endorsed by many leading manufacturers. For information and details, address:

REFRIGERATION AND AIR CONDITIONING INSTITUTE
2150 LAWRENCE AVE. — CHICAGO

Owning and Operating Costs of Air Conditioning For Office Buildings

In Cents Per Year Per Square Foot of Rentable Area Based on 15 Years' Depreciation, 6% Interest, $0.01 Per Kwh. Power, and $1.00 Per 1,000 Cu. Ft. for Water.

Zone		1	2	3	4
Hours of Refrigeration		1000	1200	1500	1700
Typical Cities		Los Angeles	New York Philadelphia Chicago	Cincinnati Memphis St. Louis	Dallas New Orleans Houston
Building Shape					
	Power	2.3	2.5	3.6	6.2
	Water	.8	.9	1.3	2.2
	Miscellaneous	5.6	5.6	5.6	5.6
	Operating	8.7	9.0	10.5	14.0
	Capital	11.2	12.5	12.5	12.5
	Total	**19.9**	**21.5**	**23.0**	**26.5**
	Power	2.4	2.7	3.7	6.6
	Water	.9	1.0	1.5	2.5
	Miscellaneous	5.7	5.7	5.7	5.7
	Operating	9.0	9.4	10.9	14.8
	Capital	11.7	13.0	13.0	13.0
	Total	**20.7**	**22.4**	**23.9**	**27.8**
	Power	2.6	2.9	4.2	7.2
	Water	.9	1.0	1.5	2.5
	Miscellaneous	6.2	6.2	6.2	6.2
	Operating	9.7	10.1	11.9	15.9
	Capital	12.6	14.0	14.0	14.0
	Total	**22.3**	**24.1**	**25.9**	**29.9**
	Power	2.8	3.1	4.5	7.7
	Water	1.0	1.1	1.6	2.7
	Miscellaneous	6.2	6.2	6.2	6.2
	Operating	10.0	10.4	12.3	16.6
	Capital	14.0	15.5	15.5	15.5
	Total	**24.0**	**25.9**	**27.8**	**32.1**
	Power	2.9	3.3	4.7	8.0
	Water	1.1	1.2	1.7	3.0
	Miscellaneous	6.3	6.3	6.3	6.3
	Operating	10.3	10.8	12.7	17.3
	Capital	14.4	16.0	16.0	16.0
	Total	**24.7**	**26.8**	**28.7**	**33.3**

NOTES:

1. For other power or water rates, correct in direct proportion.
2. Add for roof effect:

Five Stories	20%
Six Stories	16%
Eight Stories	12%
Ten Stories	10%
Above 10 Stories	0%

3. Divide terraced building into sections according to terraces or set-backs and consider each section separately.
4. Foregoing figures apply to buildings averaging more than 10,000 square feet of rentable space per floor. Should be increased about 10 per cent for buildings averaging from 7,000 to 10,000 square feet per floor.

Copyright 1935 Carrier Eng. Corp.

System for Lemon Storage House Makes Use of Natural Circulation & Night Air

LA VERNE, Calif.—An interesting application of air-conditioning equipment has been made by the La Verne Lemon Growers' Association in its storage rooms here.

The system is designed to maintain a constant temperature of 57° F., and a relative humidity of 90 per cent. Installed by the Gay Engineering Corp., it consists of two Westinghouse condensing units, connected to a common condenser and flooded-type evaporator.

These units start and stop automatically, to maintain temperature and humidity conditions at the desired point.

Because it is not necessary to run the condensing equipment during certain months of the year, and since the nights are usually cool and humidity relatively high, the plant is interlocked with a fan control and outside air damper, to take advantage of outside conditions in maintaining indoor temperature and humidity. All equipment is automatically controlled.

A special type of air conditioner was developed for this job, and a number of these units have been suspended in various parts of the storage room, connected to an air supply duct which is hooked up to the main conditioning chamber.

In the unit, water cooled by the refrigeration plant is sprayed through the nozzle. This controls the temperature of the air as well as the humidity, and also creates a natural air circulation through the unit. During some periods of operation, it is not necessary to operate the fan for the circulation of air, inasmuch as the unit has a tendency to set up its own air circulation through natural processes.

At the right of the two condensing units is a vertical cylinder, on the top of which are two sight glasses. This machine separates the oil from the liquid Freon, operating on the percolator principle.

Both condensing units have spring supports, and the discharge and suction lines are fitted with flexible tubing.

The oil equalizer connections between the two compressors are also provided with flexible tubing, permitting the compressors to float freely on the spring supports.

Roof & Basement House G-E Equipment for Zanesville Store

ZANESVILLE, Ohio — H. Weber Sons Co., local department store, is being equipped with a General Electric air-conditioning system to provide summer cooling for the top floor of its four-story building. Installation is to be made by Properaire, Inc., G-E air-conditioning dealer for Columbus and vicinity.

The system will deliver 6,000 cu. ft. of conditioned air per minute, including 500 cu. ft. of outside air. Cooling capacity of the unit will be 135,000 B.t.u.'s per hour, or an I.M.E. of 11 tons per 24 hours. The floor space to be conditioned is 104x37 ft.

A 10-hp. G-E compressor will be installed in the basement. The remainder of the air-conditioning equipment, including cooling and dehumidifying coils, filters, and blower, will be located in a central plant unit on the roof of the store.

The air, after being cooled, cleaned, and dehumidified in the roof unit, will be distributed by means of a systems of ducts within the conditioned area.

"AN OLD NAME IN A YOUNG INDUSTRY"

CURTIS

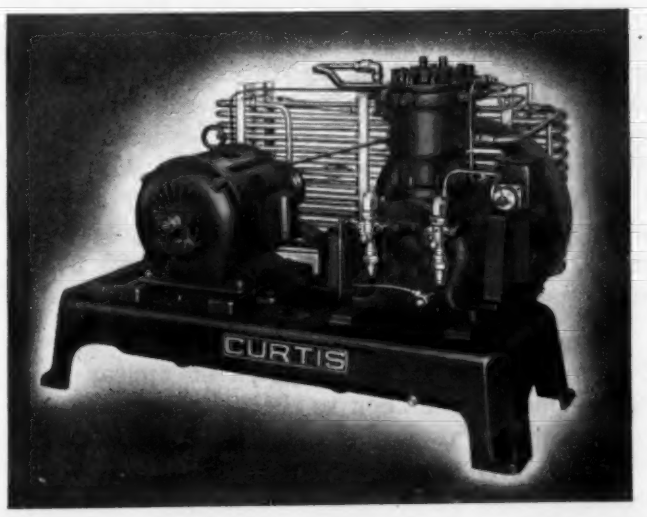
Specify CURTIS and be sure

ELECTRIC REFRIGERATION AND AIR-CONDITIONING UNITS

The sure way to satisfaction from a refrigeration or air-conditioning installation is to be certain that its most vital part—the condensing unit—is built by Curtis. Their constant, trouble-free performance is the result of 41 years' specialized experience in building fine compressors.

Complete Line—59 Units • Extra Capacity • Slow Operating Speed • Experienced Design • Low Upkeep • Rugged Construction • Fine Materials and Workmanship

Curtis enjoys the highest capital and credit rating—a Curtis product won't become an "orphan".



CURTIS Curtis Refrigerating Machine Company
Division of Curtis Manufacturing Co.
1912 Kienlen Avenue — St. Louis, Mo.

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office
Copyright, 1935, by Business News Publishing Co.
Published Every Wednesday by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich. Telephone Columbia 4242.

Subscription Rates—U. S. and Possessions and all countries in the Pan-American Postal Union: $3.00 per year; 2 years for $5.00. Canada: $6.00 per year (due to special tariff). All Other Countries: $5.00 per year (U. S. Money). See "Buyers Guide" columns for combination rates with the 1935 Refrigeration Directory and Market Data Book. Notice: We employ no subscription agents or solicitors. Pay no money to strangers claiming to represent this company. Send orders and remittances direct by mail.

F. M. COCKRELL, *Publisher*

GEORGE F. TAUBENECK, *Editor*
PHIL B. REDEKER, *Managing Editor*
FRANCES MCNAMARA, *Assistant Editor*
THEODORE T. QUINN, *Staff Writer*

GEORGE N. CONGDON, *Business Manager*
JOHN R. ADAMS, *Production Manager*
JEAN H. ADAMS, *Subscription Manager*
ROBERT P. NIXON, *Asst. Business Manager*
HELEN K. GILMORE, *Assistant Adv. Mgr.*

Member, Audit Bureau of Circulations
Member, Associated Business Papers
Member, Periodical Publishers Institute

VOL. 16, NO. 1, SERIAL NO. 337, SEPTEMBER 4, 1935

Youthful Borrowers

MANY are the signs of the nation's gradual emergence from the depression. Among them are the figures on marriage licenses issued which, in some localities, have been so high recently that one gets the impression that bargain sales must have been staged by the clerks who grant permits for wedlock. Even more interesting is the recently disclosed information that large numbers of these young newlyweds are borrowing from agencies backed by the Federal Housing Administration in order to set up their own homes.

Merryle Stanley Rukeyser, financial editor for the Universal Service, is authority for the statement that FHA-backed building and loan associations have found that "the customary borrower nowadays is under 25 years of age, whereas, according to pre-depression experience, the average borrower was 40 or more. Young benedicts are the typical borrowers at the present time."

One of the disappointments experienced by the current regime down at Washington has been the reluctance of people to borrow from the numerous governmental agencies set up to promote credit expansion. It would seem that people who have been burdened with debts contracted prior to the 1929 debacle haven't been anxious to repeat the harrowing experiences from which many of them are just now emerging. But lo! A new crop of borrowers unscathed by any previous dealings with money lenders has arrived on the scene, and it is this class of youthful home-builders which has suddenly loomed up as an important market for household appliances.

Discussing this development, Mr. Ruykeser declares that "in pre-depression days, apparently a man had to be further advanced along the economic scale in order to qualify for a loan. But now, thanks to federal cash and credit, borrowing is easier than ever, and the president of one active New York building and loan association contends that payments required of the new home owner are less than rent. In strictly financial terms, the new federalized building and loan associations have lengthened the time for paying off home mortgages from 11½ years to 20 years. As a result, the monthly payments are correspondingly smaller. Moreover, interest is charged only on the monthly debit balance, rather than on the face value of the mortgage. Furthermore, on account of the federal guarantee, venturesome leaders are willing to advance 75 per cent of the valuation of a home, whereas before the conservative building and loan associations usually voluntarily limited their percentage of advance to 60 per cent."

There's little doubt about it that the paternalistic endeavors of the government appear to offer a considerable boon to the young man who is starting out to acquire a home and family (he'll pay for it all later—and through the nose—when it becomes necessary for the government to retire the unprecedentedly high national debt). And since he is getting off to such a good start, he should undoubtedly begin with so important a household convenience as an electric refrigerator. It, too, can now be acquired on unprecedentedly easy terms.

Not only should refrigeration sales organizations take cognizance of this new market for electric refrigerators—as well as air conditioning, home laundries, ranges, and other appliances now being sold by refrigeration concerns—but they may find it advisable to study their sales presentations with a view toward revising them to interest this new and younger class of prospects.

Undoubtedly economy of operation will be a highly favored argument for use to these under-25-years-of-age borrowers. Pride of ownership should have especial appeal for young husbands who think nothing too good for their lovely brides. Home economists, with their food budgets, planned and balanced meals, and scientific methods of food preparation, will undoubtedly be effective and useful in selling the brides themselves on the idea that an electric refrigerator is an indispensable convenience. Perhaps most important of all is the health appeal—the suggestion that doctor bills, loss of work, and unhappiness can all be safeguarded against by proper food preparation.

Whatever the most effective sales appeal may turn out to be, it does seem certain that cultivating this youthful class of prospects will require a special technique, and that the sales organizations which pay the most attention to developing and putting into service this technique will be the ones which will sell the most refrigerators and household appliances to these recipients of federal aid.

The industry should welcome this opportunity to "catch 'em young," for such prospects have no contrary habits to get rid of, and once they become accustomed to having electrical servants around the house, they will be customers of the industry for a long, long time.

WHAT OTHERS SAY

Are You Interested in Potatoes? You Should Be

ORDINARILY, it is sound editorial policy for a business paper to strictly avoid taking a position on two subjects; politics and religion. We are not guilty as yet of trespassing upon the field of religion with editorial opinion and hope we never will be.

Until about two years ago, we also had been able to steer clear of what might be called political discussion, except in such minor and specialized matter as tariffs and the like which might directly affect our field. Today, we are in politics, if you want to call it that, up to our ears and expect to stay that way at least until November, 1936. When politicians plunge into business affairs to the detriment of business, as the present political party has done, it is time for business and the business papers that speak for business to get into politics.

This publication, in company with the majority of the business and industrial fields that it serves, had no prejudice against the present Administration at the outset. If proof of this is needed it may be said that The Iron Age devoted its front cover of March 9, 1933, to a sincere and heartfelt appeal for support of the new President. Since that time, however, we have become convinced by event after event that, misled by an academic clique which prefers to take its pattern from Lenin and Marx, rather than from Washington, Jefferson, and Lincoln, the present Administration has acquired an incurable anti-business, anti-initiative, anti-success complex. And we believe, further, that this can only be cured by a house cleaning that will remove from the Washington scene, the whole motly company of over-educated underexperienced and megalomaniacal dilettantes who now impose their fantasies upon the American people.

To this end, The Iron Age will do its utmost. If this be treason to the precedents of business publishing, make the most of it.

But before you do so, consider the subject of potatoes. True, iron and steel and machines are not made out of them, but what has happened to potatoes indicates what would probably happen to everything else that is raised or made if the "wild boys" in Washington succeed in hamstringing the Constitution.

On Aug. 14, Congress passed an act imposing "potato control" upon the country. Hereafter, potatoes must be packed in boxes bearing Government stamps, like cigars, and buyers of bootleg potatoes, by the act, are subject to a fine of $1,000 and imprisonment. Strict quotas of production, too, are allotted to each farmer raising more than five bushels!

Shades of the Prohibition Act! If it was impossible to prevent bootlegging of liquor and to trace down America's illicit stills, how much more impractical to regiment the homely spud. But impracticality seems to be the order of the day.

Do you blame us for becoming politically minded?—*The Iron Age*, Aug. 29, 1935.

LETTERS

Editor's Note: The first four letters in this column refer to a proposed plan to appoint a selected list of jobbers (who handle refrigeration parts and supplies), located in the principal cities, as authorized agents for ELECTRIC REFRIGERATION NEWS, the DIRECTORY, the MARKET DATA BOOK, the MASTER SERVICE MANUAL (now being prepared), and other publications to be issued by Business News Publishing Co.

Other replies received indicate that jobbers are highly favorable to the proposal and details of the plans will be announced soon. The arrangement will provide for local stocks of books and current issues, thereby permitting quicker delivery.

The plan has been developed in answer to the many urgent demands for *rush* shipments of publications and because the "extra copy" business of the NEWS has become surprisingly sizeable in volume.

"Don'ts" for Service Men?

Young Supply Co.
1050 W. Baltimore Ave., Detroit

Editor:

We have your kind letter dated Aug. 21 relative to our handling the ELECTRIC REFRIGERATION NEWS over the counter. We feel that this is a very good idea and one that should add to the service we are now giving to the refrigeration field.

Your publication is the Bible of the industry. It is well written, contains the latest information put up in a form the lay mind can grasp, and, even though it may be a business venture, has a wonderful moral effect, the extent of which cannot be estimated.

Yes we are for you, and would be glad to be counted in on any program you wish to launch.

Many schools are turning out the refrigeration men of tomorrow, long in book learning, short in experience. You have started a DON'T line, why not keep it up? Don't use oxygen in the presence of oil, don't mix other refrigerants with isobutane. You can write a book on that and many more.

More power to you and we will help.

I. M. YOUNG.

Cheers for Engineers

The Harry Alter Co.
Manufacturers and Jobbers of Parts and Accessories for Commercial and Household Refrigeration
1728 So. Michigan Ave., Chicago

Editor:

We wish to thank you for your letter of Aug. 6 and we believe that we are in a position to secure some subscriptions to ELECTRIC REFRIGERATION NEWS and would be glad to receive a supply of subscription blanks and sample copies of the NEWS, which we will place on our counters.

We believe that the service men and dealers are very interested in just the type of articles you have been publishing. We would suggest that you continue to secure articles from the engineers of the leading manufacturers. This seems to us to be the best kind of information available and will no doubt be of interest to the service men.

IRVING ALTER.

Glad to Cooperate

Henry V. Dick & Co.
Successors to D & J Supply Co.
Refrigeration and Bottlers' Supplies
514-516 Oates St., Charlotte, N. C.

Editor:

We have your general letter of Aug. 6, and note you plan to solicit subscriptions through such jobbing concerns as ourselves.

We think this is a good idea and we will be glad to give you all the cooperation we can.

We received the 15 sample copies of the July 24 issue of ELECTRIC REFRIGERATION NEWS and are distributing these to our service friends with a view of bringing to their attention information regarding this accident.

HENRY V. DICK,
Manager.

Jobber Interested

George Monjian Co.
Manufacturers and Distributors of Refrigerator Accessories
360-362 East Grand Ave., Chicago

Editor:

We have your letter of Aug. 6 and wish to advise that we are interested in your proposition of handling ELECTRIC REFRIGERATION NEWS through jobbers and distributors. We would like to hear from you further along these lines.

J. BURGE,
Sales Manager.

"Have enjoyed every copy of your valued publication. It is the best paper on electric refrigeration."—L. E. Thomas, 201 S. Everton St., Houston, Tex.

Let No Flood, Storm, Fire Or War Stop the News

Horak Brothers
Luzec n. Vlt.,
Czechoslovakia

Editor:

We have your letter of Aug. 6, 1935. (Editor's Note: Form letter sent to all May expirations—final notice.)

Owing to the fact, that we are probably the oldest subscribers of ELECTRIC REFRIGERATION NEWS in Czechoslovakia, it was not necessary to send us this threatening letter.

As far as the writer knows, we were never late with the remittance and always paid every due statement.

According to statement which was enclosed in your letter, amount of remittance is $5.00. We are in same mail giving our order to Mr. Frank Turek, 21-54 25th St., Astoria, L. I., to pay you $9 for one year's subscription to ELECTRIC REFRIGERATION NEWS and the 1935 REFRIGERATION MARKET DATA BOOK, which please send us soon.

In conclusion, the writer wishes that no flood, no storm, no fire, no war, will ever stop you from mailing the ELECTRIC REFRIGERATION NEWS to Horak Brothers. The conflict between Ethiopia and Italy is not as important as the ELECTRIC REFRIGERATION NEWS.

JAS. HORAK.

It Brought Results

Electric Invisible Kitchen
221 N. La Salle St.
Chicago

Editor:

Am pleased to tell you we just closed with the Norge Williamette Co. of Portland, Ore., and received their order.

Was very much pleased with the advertisement in the NEWS and am glad to report to you it is proving effective. We are receiving telegrams and mail for dealer and distributor connections.

E. L. BENNETT,
Vice President and General Manager.

Majestic Service

Frank M. McKey
Trustee in Bankruptcy for
Grigsby-Grunow Company
5801 Dickens Avenue
Chicago, Illinois

Editor:

In answer to your letter relative to parts and service on Majestic products, wish to advise that we are operating service under the service program approved by Frank M. McKey, trustee, and the Federal Court.

At the present time, this program makes it possible for Majestic owners, dealers and distributors to secure replacement parts and units at very reasonable cost. Therefore, we kindly request that you refer your readers to our service department here at 5801 Dickens Avenue, Chicago, and we, in turn, will then refer them to the Majestic representatives in the respective territories, who order parts from us for their stock.

P. L. YATES, Service Mgr.

After School, What?

Route 2, Box 14
South Lyon, Mich.

Editor:

I would like to take a course in refrigeration and have noticed your answer to the Ohio reader about the standing of the Refrigeration and Air Conditioning Institute of Chicago.

What I want to know is how to get a job after I finish a course.

Could you tell me the names of the manufacturers who endorse the Refrigeration and Air Conditioning Institute? I don't care if you answer this in the column or not, but I will see it there if you do. I think your paper is fine.

L. P. TUTHILL.

Service Manual Reprints

611 E. Kansas
McPherson, Kan.

Editor:

I started to take your paper five weeks ago and I must say that I think it is a wonderful paper.

On your Master Service Manual which has been running in your paper since April 10, could I send you $3.00 for the Manual to get it when it is put out and get all the back articles which has been published up to July 24?

LOY FRY.

Answer: See announcement and coupon on page 6 of this issue.

"I have been receiving the ELECTRIC REFRIGERATION NEWS for the last six weeks and I like it very much. I think that it is a very interesting and helpful paper for any one who is connected in any way with the refrigeration industry."—Roy L. Slaughter, Route No. 2, Box 336, Boring, Oregon.

"ELECTRIC REFRIGERATION NEWS appears on my desk as rapidly as the postman will deliver it, and is read from start to finish with a great deal of interest; and is, of course, our standard reference guide on anything worthwhile happening in the industry."—F. E. Stern, president, Stern & Co., Inc., distributor of electrical specialties, Hartford, Conn.

WANTED: INFORMATION on VALVES and FITTINGS—

by manufacturers, for help in planning specifications on 1936 models; by parts jobbers, for use in rounding out the lines of merchandise they will carry during the coming year; by independent service men, seeking replacement parts and a knowledge of their care and servicing.

ANSWER: SEE ELECTRIC REFRIGERATION NEWS
DATE: SEPTEMBER 25
FEATURING: VALVES and FITTINGS

Manufacturers are now planning 1936 electric refrigerator models. The engineering departments are already busy with many of these units. New parts and materials are being tried out, and changes are being planned for the models of the coming year. They need information on parts. More than at any other season they are now on the lookout for new mechanical improvements and better materials.

In coming issues (Sept. 25 through Nov. 7) ELECTRIC REFRIGERATION NEWS will feature PARTS. New items now introduced on the market will be given special attention; engineering articles will reflect progress in the various designs and applications to refrigeration. Other editorial information will deal with the care and servicing of parts.

Right now there is a great opportunity for parts manufacturers to present their sales message effectively. Advertising in an editorial setting designed to meet specific needs for information at this season *will get your sales message across.*

Right now is the time to tell these manufacturers what you have to offer and how your product will fit their needs.

Parts jobbers, too, will use these issues in planning their lines of merchandise for 1936. And service men will be particularly interested in the articles on parts servicing and care.

Mark the date—September 25—and plan your merchandising in the NEWS to make the most of this opportunity.

RESERVE YOUR SPACE NOW

An outline of the program for other coming issues of the News to feature new developments in refrigerator parts, also the servicing of parts, is given below:

Oct. 2—Condensing Units and Parts

This issue will cover complete condensing units available for assembly of 1936 household electric refrigerator models, and will afford a "preview" of 1936 commercial refrigeration machines. Also to be given consideration are new developments in compressor parts, condensers, refrigerants, and compressor oils.

Oct. 9—Motors and Motor Controls

New features of motors and motor controls for refrigeration and air-conditioning applications will be outlined, and special editorial attention will be given to the care and servicing of these items.

Oct. 16—Cabinets and Cabinet Parts

New styles in cabinet design and construction will be described and illustrated in this issue, and the editorial spotlight will be focussed on cabinet finishes, insulation, gaskets, breaker strips, shelves, and nameplates.

Oct. 23—Evaporators

This issue will deal with new developments in evaporators for both household and commercial applications. Other parts designated for special attention in this issue are ice cube trays, and ice cube tray accessories.

Oct. 30—Refrigerator Accessories

Accessory items for use with household electric refrigerators have become increasingly important in the past few years, and this issue will tell what's going to be available for the "inside" of 1936 models.

Nov. 7—Service and Installation Equipmen

Service and installation men are constantly on the lookout for new tools and equipment which will enable them to do a better job and with less time and effort. The Nov. 7 issue will describe the design and application of newly developed instruments manufactured particularly for use by the refrigeration service man.

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Mich.

UNDERWRITERS' REVISE COMMERCIAL SYSTEM STANDARDS

Standards Changed for Motor Controls, Refrigerant and Copper Tubing

(Editor's Note: The 1935 "Standard for Commercial Refrigeration Systems," issued by Underwriters' Laboratories, Chicago, is reprinted in full on this page. Changes are summarized in a story on page 1.)

This Standard supersedes Standard for commercial refrigerating systems dated Aug. 16, 1933.

General

This Standard covers commercial refrigerating systems classified as Class C, D, and E systems.

A commercial and/or air-conditioning system is one which is used in a commercial and/or a business place, such as meat market, florist shop, hotel, office building, restaurant, and other places of similar commercial enterprise, assembled and installed in the manufacturing and/or business portion of any building.

The classification refers to the total amount of refrigerant contained in or required for the proper operation of the refrigerating system. The systems covered by these specifications are defined as follows:

Class C system is one containing more than 20 pounds but not more than 100 pounds of refrigerant.

Class D system is one containing more than six pounds but not more than 20 pounds of refrigerant.

Class E system is one containing six pounds or less of refrigerant.

The listing of equipment for commercial refrigerating systems is confined to an examination and test of the component parts, together with a review of the manufacturer's installation specifications. The listing signifies that all parts have been tested, found suitable, and are capable of being properly installed.

Note: Manufacturers should be advised and consult local authorities having jurisdiction as regards installation specifications and requirements.

This Standard is based upon records of tests and field experience and is subject to revision as further experience and investigations may show to be necessary or desirable.

Devices or products which comply with this Standard will not necessarily be acceptable if they have other features which, when examined and tested, are found to impair the results contemplated by this Standard.

A device or product having materials or forms of construction differing from those detailed in this Standard may be examined and tested according to the intent of the Standard and, if found to be substantially equivalent, may be given recognition.

Editor's note: Requirements are shown in and are supplemented by explanatory notes and descriptions of test apparatus which are indented.

Design and Construction

All parts shall be made of materials suitable for the purpose intended and shall be accurately assembled so as to assure proper functioning under all conditions of service.

Electrical Construction

Technical compliance with the following specifications will not be sufficient, as due consideration will be given to the choice of materials, the quality of workmanship, and shop practices in so far as these items may have a bearing upon the safety of the device from a fire and accident standpoint.

Wiring

Circuit wires of other than portable machines shall be identified as to polarity by having the neutral (grounded) conductors finished a white or natural gray color and all other conductors of that circuit finished to show solid colors other than white or natural gray. Single-pole switches shall not be connected to the white or natural gray conductors.

Wiring shall be accomplished with rubber-covered or varnished cambric wire enclosed in listed rigid, or flexible metallic conduit, armored cable, or other suitable metal enclosures.

Note: The use of varnished cambric type of wire is restricted to dry locations and, when used, conductors must be not less than No. 14 Awg.

The ends of all rigid metallic conduit lengths, including nipples, shall be reamed after threading. At all points where conduit terminates in fittings, provision shall be made for bushing the conductors to provide a smooth and well-rounded edge over which the conductors may pass. In addition, in the case of armored cable an acceptable insulating bushing or its equivalent shall be provided between the conductors and the armor at the point where armor terminates in the fitting.

Material used as a raceway, where sharp bends are unavoidable, shall be subject of a special investigation before being accepted. The raceway used for such installations shall be given as much protection as is practicable by virtue of its installation and shall be as short as is practicable.

Listed armored cable connectors and/or listed lock nuts and bushings shall be used in securing rigid or flexible conduit or armored cable and cable runs to boxes and other fittings. Listed or suitable outlet or junction boxes shall be provided at the ends of conduit or raceway runs for high-voltage circuits. Provision for conduit connection on all cast-metal devices shall be made in accordance with the following: A drilled hole in a ⅛-in. cast-metal wall, a threaded hole in a section not less than ¼ in., or a provision for conduit connection having five full-cut threads, and a conduit stop providing smooth edges, shall be considered acceptable.

Wires of circuits operating at potentials in excess of 25 volts other than factory connected leads of devices or appliances shall be rubber-covered conductors not smaller than No. 14 Awg. Factory connected leads between integral parts of a unit shall be not less than No. 18 Awg. Wiring subject to temperature in excess of 49° C. shall have a heat resisting insulation.

Wiring shall be so located as to be free from all oil-retaining surfaces or moving parts which may have deteriorating effect or cause mechanical injury.

Conductors shall have sufficient current-carrying capacity, in accordance with paragraph (a) of section 612 of the national electrical code.

Wires shall be so spliced or joined as to be mechanically and electrically secure. Joints shall be soldered, brazed, or fused together unless made with a splicing device and shall be covered with a rubber and friction tape equivalent to the insulation of the wires. Listed solderless wire connectors, when used, shall be judged for suitability on each application.

Wherever conductors extend through metal walls or barriers within a common enclosure, the openings shall be protected by smooth-edged bushings, or formed to provide the equivalent.

All wiring devices, such as attachment plugs, cord connectors, snap switches, receptacles, cutout bases, etc., shall be listed, or shall be investigated and judged for suitability.

Controller

Controllers incorporated in the assembly of the refrigerating system shall be listed, or shall be judged in accordance with the requirements contained in the standard for industrial control equipment.

Motor

The motor utilized in the assembly of a refrigerating system shall be of adequate size for the intended purpose.

Note: Adequate size shall be interpreted to mean capable of "pull down" in an ambient temperature of 40° C. (104° F.) from equalized pressure conditions without hazardous overheating of the motor. (See Hot Room Test). If the "pull down" is interrupted by the motor protective device, the latter shall be reset and the test continued.

Motor Protection

All motors used on refrigerating systems shall be adequately protected against hazardous overheating under normal and abnormal operating conditions.

Protective devices such as controllers incorporating thermal relays may have a heating element with a current rating of 140 per cent of the full load rated current of the motor. If the element rating exceeds 140 per cent, tests will be conducted in accordance with the procedure under "Electrical Tests."

Note: The service to which refrigerating system motors are subjected is essentially "varying duty." Tests of overcurrent protective devices for motors so used have shown that suitable protection is provided when overcurrent devices are rated not in excess of 140 per cent motor full load current rating.

Manufacturers producing systems utilizing motors of more than 1-hp. rating should provide specific indication of the rating of the protective devices supplied if such rating is in excess of 125 per cent motor full load current rating. The marking "varying duty" or a notice worded somewhat as follows and suitably attached and located on the motor or controller device will be considered specific indication.

"Since this motor operates on 'varying duty' service (A. I. E. E. definition: 'varying duty is a requirement of service that demands operation at loads and for periods of time which may be subject to wide variation') the motor protection of 140 per cent motor full load current rating is adequate."

Fuses employing the usual type of cutout base are not recognized as suitable motor-running protection. Special designs shall be subjected to test to determine their suitability.

Refrigerant

The refrigerant shall possess sufficient chemical stability to prevent dissociation or other changes which are likely to lead to the formation of hazardous substances when subjected to the maximum range of temperatures and pressures as encountered in the refrigerating cycle.

Refrigerants used in air-conditioning systems employing direct method of refrigeration shall be practically nonflammable and shall be of a lower degree of toxicity than group 4" as defined on page 106 under "Summary" of Underwriters' Laboratories' report, MH2375, entitled "The Comparative Life, Fire, and Explosion Hazards of Common Refrigerants."

Strength

All parts of the high-pressure side of air-cooled refrigerating systems which are subject to pressure shall be designed and constructed with a factor of safety of at least 5 based on the maximum pressures obtained during the operation at 40° C. (104° F.). (See hot room test).

All parts of the high-pressure side of water-cooled refrigerating systems which are subject to pressure shall be designed and constructed with a factor of safety of at least 5, based on the maximum setting of the pressure-limiting device.

All parts of the low-pressure side of the refrigerating systems which are subject to pressure shall be designed and constructed with a factor of safety of at least 4, based on the vapor pressure of the refrigerant used at 70° F.

Note: In no case shall the hydrostatic pressure be less than 100 lbs. per sq. in.

All parts shall withstand pressures higher than the relief pressure generated under fire conditions.

Note: In so far as strength is concerned, the acceptability of the controller mechanism and compressor crankshaft seal shall be based upon the performance of these parts during the Hot Room Test.

Pressure-Limiting Device

A pressure-limiting device is required on the following systems to stop the action of the pressure-imposing element at a pressure less than 90 per cent of the setting of the pressure-relief device located on the high-pressure side of the system:

Class C air-cooled system.

Class C, D, and E water-cooled systems.

Pressure-Relief

A pressure-relief device in the form of a fusible plug, frangible disc, relief valve, or other suitable device, shall be installed in the system to relieve the pressure in the system in the event of abnormal temperatures, such as generated by a fire.

Note: A pressure-relief device is not required on systems so constructed that pressure due to fire conditions will be relieved safely by soldered joints, lead gaskets, or other parts of the system. (See Fire Test).

Refrigerating systems not equipped with acceptable pressure-relief devices or joints or other features of design judged to be equivalent may be subjected to a fire test to determine whether hazardous conditions such as excessive pressures will be created.

Valves and Tubing

Instructions shall be provided with each system indicating the necessity of opening valves before starting the machine.

Seamless annealed copper tubing up to and including ⅝ in. O.D. shall have a nominal wall thickness of 0.035 in. Seamless annealed copper tubing ¾ in. O.D. shall have a nominal wall thickness of 0.042 in. The tolerance for the wall thickness may be plus or minus 0.003 in.

Note: When the tubing is protected against mechanical injury, the nominal wall thickness may be 0.028 in. for sizes up to and including ⅝ in. O.D., and 0.035 in. for ¾-in. O.D. tubing. The tolerance for the wall thickness may be plus or minus 0.0025 in. and 0.003 in. respectively.

Wall thickness specifications for hard copper pipe up to and including 1½ in. nominal size are as follows:

Hard Copper Pipe

Nominal Size	Actual Diameter	Wall Thickness
⅛	0.250 in.	0.025 in.
¼	0.375 in.	0.030 in.
⅜	0.500 in.	0.035 in.
½	0.625 in.	0.040 in.
⅝	0.750 in.	0.042 in.
¾	0.875 in.	0.045 in.
1	1.125 in.	0.050 in.
1¼	1.375 in.	0.055 in.
1½	1.625 in.	0.060 in.

Convecting Medium

The convecting medium shall have no deleterious effect on food stuffs. Consideration shall be given to the corrosive effects of the convecting medium.

Manufacturer's Tests

The manufacturer shall test all pressure-containing parts of the system at pressures shown in the following table:

Minimum Pressures

(Lb. Per Sq. In. Gauge)

Refrigerant	High-Pressure Side	Low-Pressure Side
Ammonia	340	230
Dichlorodifluoromethane (Freon F-12)	195	140
Dichlorotetrafluoroethane (F-114)	65	50
Ethyl Chloride	50	50
Isobutane	110	70
Methyl Chloride	175	120
Methyl Formate	50	50
Methylene Chloride (Carrene)	50	50
Monofluorotrichloromethane (F-11)	50	50
Sulphur Dioxide	135	89

For refrigerants not covered in the above table the minimum test pressure for the high-pressure side shall be not less than the vapor pressure of the refrigerant at 135° F. For the low side the test pressure shall be not less than the vapor pressure of the refrigerant at 110° F.

Note: In no case shall the high or low-side test pressure be less than 50 lbs. per sq. in.

The manufacturer shall conduct periodically an ultimate strength test on all pressure-containing parts to determine whether the strength of parts is comparable to that obtained by Underwriters' Laboratories' hydrostatic tests.

Note: It is recommended that these tests be made at least every three months.

Marking

Each commercial refrigerating system condensing unit shall carry a name plate marked with the manufacturer's name and address, model number, name of refrigerant used, and the high and low-side test pressures applied. Each part of the system, in addition to the condensing unit, such as controller, or cooling unit, shall be marked with a model or type designation. A master name plate or other suitable notice indicating the manufacturer's name, also name and amount of refrigerant, shall be located conspicuously on or near the condensing unit.

Uniformity

All parts shall be made with a degree of uniformity and grade of workmanship practicable to maintain in well-equipped shops fabricating materials as employed in these systems.

Examination and Test

Study and Design

The complete refrigerating system shall be carefully examined for details of design bearing on the accident hazard. Exposed fans, belts, and pulleys shall be suitably guarded, and the refrigerant tubing shall be protected against mechanical injury.

Factory Inspection

A visit shall be made to the manufacturer's factory to examine the methods of manufacturing and fabricating, also to check the facilities for testing the equipment.

Normal Operation Test

Each refrigerating system shall be operated for a sufficient period at normal room temperatures to record the normal operating temperatures and pressures. Current and voltage readings shall be recorded during this test.

The system shall be adjusted to produce operating conditions which will check the functioning of the controller, water valve, or other automatic appliances employed with the system.

Hot Room Test (Air-Cooled Equipment)

A complete refrigerating system shall be operated in a room at a temperature of approximately 104° F. and allowed to cycle for a sufficient period to ascertain operating pressures.

During this operating period the maximum high-side pressure shall be recorded.

With high and low-side pressures equalized, the system shall be started and operated through the "pull down" period. During this test observations of the motor shall be made to determine whether hazardous conditions exist. This "pull down" test shall be made in accordance with the manufacturer's recommendations for actual installations.

The starting and running current of the motor shall be recorded during these tests.

Electrical Tests

Thermal overcurrent protective devices shall operate in accordance with the requirements of the standard for industrial control equipment and also under all conditions insure adequate protection for the motor.

If the rating of the thermal overcurrent element exceeds 140 per cent of the full load current rating of the motor, the system shall be adjusted, overloaded, etc., so as to obtain a current input just below the current rating of the thermal element. Under these conditions the system shall be operated until constant motor temperatures are attained and observations shall be made to determine whether hazardous conditions exist. This test shall be conducted in a 104° F. ambient.

Pressure-Limiting Device Operation Test

The pressure limiting device shall be adjusted to the maximum setting and the refrigerating system loaded to produce head pressures sufficient to operate the pressure limiting device. The system shall be operated under these conditions for a sufficient period to cause the pressure-limiting device to cycle through at least 10 operations. The performance of the pressure-limiting device and the uniformity of the "cut-in" and "cut-out" pressures shall be noted.

Hydrostatic Strength Test

From one to three samples of each pressure-containing part (except controller mechanism and compressor crankshaft seal) shall be tested hydrostatically. The factor of safety as specified under "Strength" shall be observed.

Note: By special arrangements these tests may be conducted at the factory.

Refrigerant Test

If the chemical, physical, and physiological properties of the refrigerant are not available, special tests shall be made to determine these properties.

Pressure-Relief Device Test

At least five samples of the pressure-relief device shall be tested to ascertain dependability and accuracy of operation. The relief pressure shall be less than the pressures corresponding to the ultimate strength of the parts. (See "Strength" and "Hydrostatic Strength Tests.")

Fire Test

A fire test, if necessary, shall be conducted in the presence of a laboratories' engineer.

This test shall be conducted on a fully charged system to determine the manner in which pressure in the system is relieved. The maximum pressure developed shall be recorded.

AIR CONDITIONING

Close Control of Humidity Necessary in All Steps of Rotogravure Work

CHICAGO — In the rotogravure printing industry, with every phase of its culture and manufacture extremely sensitive to temperature and humidity, air conditioning has become an accepted necessity. A good example is to be found in the installation made by Frigidaire Corp. in the plant of Alco Gravure, Inc., here.

First consideration in the atmospheric needs of a modern rotogravure plant is proper and definite humidity with very slight variations. This is necessary because constant regain of moisture is responsible for constant paper stretch and perfect registering of multicolor impressions.

Sensitiveness of the carbon tissue to regain moisture, because of its great absorbing qualities, demands of the air-conditioning system definite humidity and dry-bulb temperatures during the entire year. Variations not to exceed 1¼° F. on the dry-bulb thermometer were desirable, with variations of 1 to 3 per cent in relative humidity considered excessive.

Desirable Conditions

Careful analysis of this particular industry indicated the following as the most desirable conditions:

	Dry Bulb	Relative Humidity
Etching department	72° F.	50%
Photo Gallery	74° F.	50%
Retouching department	75° F.	50%
Sensitizing of carbon printing	72° F.	50%
Dark rooms	74° F.	50%
Drying room	75° F.	50%

Considerable thought was given in the design of this system to the possibility of cutting operating expense while accomplishing the desired results. Cooling required was the difference between the total heat of the mixed fresh air and recirculated air, and the total heat at the determined saturation or dew point which in this instance equalled the equivalent of 60 tons.

Obviously, as the fresh air temperature decreased, so would the total heat of the mixture decrease and thereby decrease the amount of refrigeration necessary to reach saturation. It can be readily seen that it would be a waste of money to operate large tonnage compressors when perhaps the mixing air condition was such as would require perhaps only 10 tons of refrigeration.

It was therefore decided to install six condensing units of approximately 10-ton capacity each.

Multiple Evaporators

As a further assurance of economy of operation multiple evaporators were installed. Evaporators totaling approximately 60 tons capacity were arranged within the main air-conditioning chamber in banks of two deep. Each evaporator was designed for a minimum pressure drop and carefully balanced between sensible and latent capacity.

Thus as the compressor and evaporator requirements decrease, an automatic refrigeration control is provided, in that part of the air will pass through the evaporators not in use, with the balance of the air passing over the cooled surfaces of the required evaporators.

It has been mentioned that the mixture of fresh and recirculated air was brought to a saturated state, which because of the conditions to be maintained was determined at approximately 52° dew point.

Changes in Heat Gain

With the air in a state or condition which was controllable regardless of outside conditions or internal heat gain sources, the next step was to determine the desired leaving air temperature and condition under the peak operation.

Because of the possibility of only one or two departments being in operation, with the others temporarily inactive, means had to be provided to overcome changes in internal heat gain.

In other words, as the heat gain decreased beyond that estimated, heat had to be provided so as to maintain the constant temperatures desired. Therefore booster heating coils were installed in the branch ducts leading to each department, the control of which will be mentioned later.

Humidifying apparatus of both the steam and water spray type was installed in the main coil casing, the spray type intended for summer use and the steam grid type being used during the winter.

Reheat coils were also installed in the coil casing to raise the temperature of the air leaving the evaporators to the desired leaving air temperature of 60° for peak conditions in any department.

Proper distribution of the air with the right amount of diffusion was of as much importance in the design of this system as the arrangement of the temperature regulation. It was found that where conditions were required such as the above, with no variations throughout the entire conditioned area, a minimum of air movement was necessary.

To accomplish this, it was decided to supply air through several diffusion type supply outlets and at an unusually low velocity, returning this air to the ceiling directly behind the supply outlets. This system required 21,000 cu. ft. of conditioned air per minute to be circulated.

A slow speed, quiet operating supply fan was selected and was set to discharge the air into the main trunk supply ducts at a velocity not to exceed 1,000 ft. per minute which permitted an outlet velocity at the grille of approximately 300 ft. per minute.

Smoke Test of Distribution

Smoke tests were made, and because of the perfect distribution, it was difficult to determine the spread of the smoke, which proved conclusively during the test that the air was being distributed as calculated.

A temperature and humidity control system of the pneumatic type was selected. Each department had its individual thermostat which controlled a diaphragm steam valve on the booster heating coil. To assure "hair-line" control, thermostats of the all metal type with bi-metal thermal elements, and which could be calibrated on the job, were selected.

The humidistats used, were connected to an electro pneumatic switch, and arranged so that when the air-conditioning system was shut down, the humidifiers automatically shut off. The humidistats were connected to both a spray type humidifier and steam grid humidifier. It was intended that the steam grid humidifier be used during the winter months and the spray type be used during the summer months.

The entire cycle of the temperature regulation can be described as follows:

Air Ducts Controlled Automatically

The fresh air and return air ducts were automatically controlled by means of automatic balancing dampers which in turn were controlled from a thermostat. This thermostat was set in the mixing air stream preceding the air filters.

After the air had been properly filtered, it then passed through the multiple evaporators which had its refrigerant controlled from the dew point thermostat. This thermostat was set at the saturation point determined, 52.2°.

Thermostat Operation

This thermostat was connected to a stage and sequence control panel which has a graduated dial for each solenoid valve and which may be set to bring that particular solenoid valve into operation in any predetermined sequence with regard to the other valves.

With this method of control, the solenoid valves may be operated one at a time, at any sequence, or may be operated together in groups in any sequence. In this way, a very flexible control is obtained in a manner that prevents rapid fluctuations in fan discharge temperature, and naturally shows its effect on the savings in operating costs by calling for only as many compressors as required.

Functions of Humidifiers

After the air leaves the evaporators, its moisture content may be too low due to entering mixed air being low, and as such, the sprays or grid humidifiers begin to function as demanded by the respective humidistats. The air then leaves the humidifying chamber and passes through a reheat coil which is controlled from an immersion type thermostat located at the inlet side of the supply fan.

This thermostat is set at 60° dry bulb which is the dry-bulb temperature determined in the calculations dependent upon the quantity of air handled to pick up the sensible heat gain.

The air is then discharged by means of the supply fan into the main trunk ducts leading to the various departments. Each of these trunk ducts is provided with the booster heaters which are controlled from a thermostat located in the respective departments.

The booster heaters, reheaters, sprays, and evaporators are in operation both summer and winter as required to maintain the final desired dry-blb temperature and relative humidity. In other words, this system will always require some refrigeration, even during the coldest wintry days.

New Conditioner For Winter Applications Introduced by G-E

BLOOMFIELD, N. J. — General Electric Co. has developed and will place on the market immediately a new direct-fired warm air conditioner, combining the functions of heating and warm air conditioning in one compact oil-burning unit.

Designed for the small home of about six rooms, the new warm air conditioner will be priced to place the company in a favorable competitive position in the domestic heating and air-conditioning industry, J. J. Donovan, manager of the G-E air-conditioning department, declared last week.

The principle of impact expansion atomization, announced three years ago when General Electric introduced its oil furnace, is incorporated in the new warm air conditioner. The oil is broken into a fine mist, effecting combustion of the lower grade fuel oils in which the heat content is claimed to be greatest. The flame burns downward and the flue is at the bottom, providing efficient utilization of heat.

The new warm air conditioner has a heat rating of 133,000 B.t.u.'s per hour, and will deliver and properly circulate approximately 1,680 c.f.m. of cleaned, humidified, tempered air. Not less than a gallon of water per hour will be used to give adequate humidification in cold weather. A hot water supply heating coil and also a cooling unit will be available for use with the new unit.

The unit is housed in an attractive rolled steel jacket in two-tone gray, with black and chromium trimmings. Standing 5 ft. 6 in. high, it occupies but 2 ft. 9 in. x 5 ft. 7 in. of floor space.

BOOKS

Air Conditioning and Engineering

Edited by the Engineering Staff of American Blower Corp., and Canadian Sirocco Co., Ltd. Pages: Technical section, 359; Apparatus and Equipment section, 331.

"The science of air engineering, which includes the conditioning and handling of air and gases, is becoming an increasingly important factor in almost every field of endeavor," states the preface of this edition, a veritable encyclopedia of facts, charts, and figures concerning all phases of air conditioning and engineering.

"A more congested population and a more complex industry are calling upon this science for assistance in the solution of many of their accumulating problems."

A great mass of material has been accumulated on the subject of air conditioning and engineering, some of which has been published—but most of which has remained hidden in private files and notebooks. To collect all this material in a single volume, conveniently arranged for quick reference, has been the thought back of this book.

To that end, there are included in this book fundamental principles, laws, and tables, determined experimentally or mathematically; sample calculations in considerable detail; comprehensive information relating to dimensions and capacities; and a compilation of application data based on the experience of the authors, their predecessors, and contemporary engineers throughout the country.

All subjects are treated in a practical manner, so that those who make use of the book can solve most air engineering problems by using the data which it contains, requiring the aid of experienced fan engineers only on exacting or complex applications.

In the technical section of the volume, subjects considered include:

Air; heat and steam; air flow; air ducts; fans; power selection for fan drive; sound; ventilation; heating; unit heat and unit ventilators; humidifying; cooling and dehumidifying; refrigeration; temperature and humidity control; vapor absorption and removal; drying; ceramics; furnaces; mechanical draft; fume collection and removal; dust collection and pneumatic conveying; mine ventilation; and a list of tables and conversion factors.

The apparatus and equipment section lists:

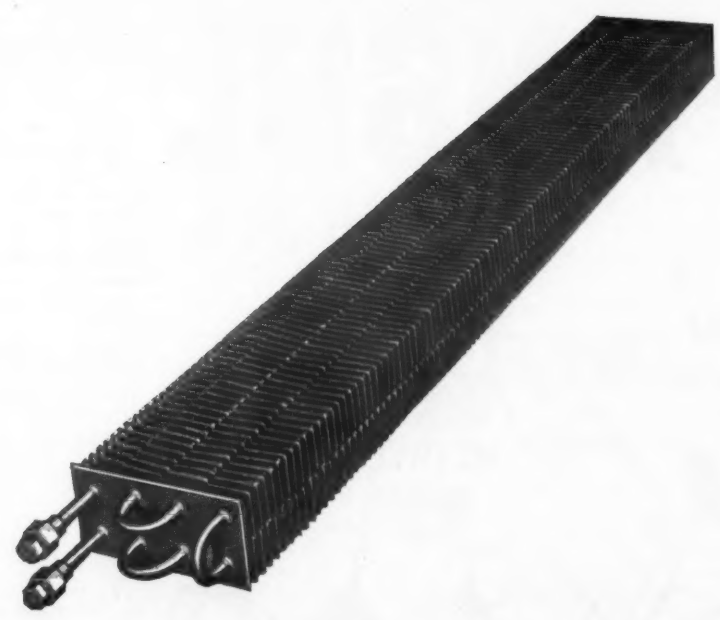
A. B. C. cooling tower fans; A. B. C. engines; A. B. C. pipe coil cleaners; Aerofin; Aeropel ventilators; American H. S. fans; Acroblast copper fin heaters; arrangements and discharge of fans; decalorators; hydraulic couplings; domestic forced draft fans; ice melting tanks; line flow furnace fans; mechanical refrigerating machines; pumps.

Series B Sirocco conditioners; Series O Sirocco conditioners; Series R Sirocco conditioners; Sirocco blowers; Sirocco coolers, Series C; Sirocco dust collectors, Type D; Sirocco fans; Sirocco furnace fans; Sirocco mechanical draft fans; Sirocco mine fans; Sirocco mine sets; Sirocco unit heaters; Sirocco washers and dehumidifiers; Sirocco wheels for appliances.

Special type P fans; steel plate fans; Type D disc fans; Type D mine fans; Type E fans; Type F fans; Type MD fans; Type MS fans; Type P fans; Type P forge blowers; Type V fans; universal units; Vento hot blast heaters; Ventura automatic shutters; Ventura home conditioner, Series H; Ventura fans; and Venturafin unit heaters.

BUSH COIL PRICES LOWER

REFRIGERATION DISTRIBUTORS AND DEALERS WILL FIND IN OUR NEW PRICE SHEETS ATTRACTIVE REDUCTIONS IN THE PRICES OF COILS USING 2¾" FINS WITH ½" AND ⅓" SPACING



PLEASE ADVISE US AT ONCE IF YOU HAVE NOT AS YET RECEIVED THESE NEW PRICE SHEETS AND COPIES WILL BE MAILED IMMEDIATELY

THE BUSH MFG. CO.
HARTFORD, CONN.

NEW YORK 489 FIFTH AVE. | PHILADELPHIA 2401 CHESTNUT ST. | DETROIT 6432 CASS AVE. | CHICAGO 610 N. OAKLEY BLVD

MASTER SERVICE MANUAL
Chapter 7

How to Care for and Service Repulsion-Induction Motors

By K. M. Newcum

70. Repulsion Start-Induction Run Motors (Continued)

Each end plate of the motor houses a bronze bearing. The bearings have a slot at the top immediately under the oil well cover, which exposes the shaft. Over this slot and down into the oil wells, a wick made of many strands of wool yarn is placed. This wick draws the oil from the bottom of the well up to the shaft to provide lubrication.

There is a small oil filler cup over each bearing, through which small quantities of oil may be added slowly. Very often this cup shows full when only a few drops of oil have been added. It is recommended that each time the service man is servicing any part of the system that he remove the oil well covers, and fill both oil wells with a good grade of automobile oil, until oil is noticed at the overflow provided. This assures a properly saturated wick and full oil reservoir, usually sufficient to last one year.

It will do no harm to instruct the user to add a few drops of oil to each bearing at regular intervals during the year.

The oil well covers are equipped with a spring that holds the wick in contact with the shaft. These covers should never be left off or left loose as the contact between the wick and the bearing may be broken. The covers also protect the bearing and oil well from flying dust and dirt.

Where a motor bearing has run hot from lack of lubrication, it is good practice to remove the end plate or plates, remove the wick or wicks, thoroughly clean them with kerosene, and at the same time clean the oil wells.

When the wick has run dry, the heat from friction between the shaft and bearing may have burned the wick to a point where it should be replaced with a new one. Always completely saturate the wick and fill the oil well up to the overflow with new oil after cleaning or replacing the wick.

Worn motor bearings will cause the motor to chatter when starting. The amount of wear may be determined by removing the pulley from the shaft and moving the shaft up and down. If the oil between the shaft and bearing shows movement, the bearing is worn.

The main danger with badly worn bearings is that the rotor may drag on the stator and either bind or stick, which will damage both the rotor and the stator and/or cause the motor to burn out. This condition may be determined by removing the belt and revolving the shaft by hand with the current off.

It is impractical to replace motor bearings on the job. This work should be done in a shop properly equipped to align and ream the new bearings to a proper fit with the shaft.

Most refrigeration service men are not equipped with the necessary instruments to check motors for grounds, shorts, and other electrical troubles, and should not spend too much time on the job with a stubborn motor. If the governor weights and push rods are free and in good shape, the short circuiting mechanism is functioning properly, the brushes and commutator in good condition, and the bearings are properly oiled—and still the motor refuses to operate satisfactorily, it should be replaced. All possible causes for an overload on the motor should also be checked.

Most all other standard repulsion-induction motors used on refrigerating systems have the same general operating characteristics as the one illustrated and described. A fractional hp. repulsion-induction 110/220 volt a.c. Century motor is illustrated in Fig. 120. In the cutaway illustration, the various working parts may be seen.

Note the governor weights at the left end of the rotor, and the push rods.

The governor weights are of different design than those used in the Wagner motor, but their purpose is the same. That is, when the rotor attains a speed of around 1100 r.p.m., the weights have thrown out (spread) sufficiently to move the push rods, spring barrel, short circuiting necklace, and parallel motion brush lifting fingers with enough force against the pressure of the governor spring to lift the brushes from the commutator. The motor then runs on induction.

The governor device is rust proof and should cause no service difficulties as long as it is free from foreign matter such as gummy oil, dirt or insulation material. The push rods are in constant contact with the governor device and the spring barrel, and are subject to wear after long service. The short circuiting necklace is composed of several copper segments, as in the Wagner, and subject to the same general service conditions.

Century's brushholder is threaded so that it screws on to a place provided on the commutator end plate of the motor. It is adjustable for reversing the direction of rotation. It is also adjustable as to the distance from the commutator. This distance in small motors should be ⅛ inch.

The brushholder is equipped with parallel motion fingers, which contact the spring barrel. As the governor device throws out and moves the spring barrel, the brush lifting fingers are moved against the pressure of the brush springs and the brushes are free to move away from the commutator. When the motor is idle, the fingers are in and the springs hold the brushes in contact with the commutator.

Although these are moving parts, they should not be oiled. The brush lifting fingers are subject to wear at the point of contact with the spring barrel, and should be checked as a possible cause for the brushes to hang on the commutator.

The pressure of the governor spring is adjustable. The length of time required for the brushes to throw out is the same as given in the section on the Wagner motor.

One of the more common service complaints on motors is noise. Many of these complaints are caused by end play between the ends of the shaft and the bearings. It is a result of the rotor shifting sidewise due to vibration of the condensing unit. The noise may be described as a knocking noise, and is easily identified by removing the belt and moving the shaft in and out.

When the motor is originally assembled at the factory, the proper amount of spacer washers, commonly called shims, are installed on each end of the shaft, so that when both end plates are pulled up tightly into place the rotor is free turning yet has very little end play. The shims are subject to wear in time.

When shimming a motor, the service man is often tempted to add shims only to the commutator end as it is more accessible. Shimming only one side of the motor will throw the rotor out of line with the stator, and if shifted any appreciable amount may cause a hum in the motor during the running period.

It will also cause the rotor to "pull" in an attempt to get back in line and cause excessive wear on the shims. Shims of different thickness and material are obtainable. When removing end play, an equal amount of shims should be placed in each end of the motor.

Steel or bronze shims will wear longer than fibre shims. The fibre, however, will tend to reduce the knocking noise of end play. A steel spring-type of spacer washer is now used in some designs. Its design anticipates that the motor may have a slight amount of end play, yet any rebound will be absorbed or cushioned by the flexing ability of the spring.

It is not considered good practice to leave the end plate screws loose to prevent binding when the motor is over shimmed. It is better to have a little end play. The loose end plates may shift slightly throwing the bearings out of alignment. Any condition causing an overload on the motor will make end play more noticeable. High head pressure is one of the most common causes of an overload.

A loose or split motor pulley will also cause a load knocking noise on the shaft with a set screw through the pulley.

This set screw my have a square or hex head for ordinary wrench operation. Many of the set screws are of the Allen type, and have a hex hole in them. This design makes necessary the use of an Allen set screw wrench of the proper size for the opening. It is impractical to tighten this type of set screw with a screw driver or other improvised tool.

Often in servicing a motor, it is necessary to remove the motor pulley. With the set screw loosened, the pulley should slide off the shaft with little difficulty. If the pulley is difficult to remove, the shaft should be checked for high spots.

Any high spots noticed may be removed by holding a mill file on the shaft while the motor is running. This is recommended over forcing the pulley back on the shaft, and may save the service man some time and difficulty the next time the pulley is removed.

The motor pulley should always be located on the shaft so as to properly align the belt with the fly wheel. If the belt is out of alignment, it will cause excessive wear on the belt and also excessive wear on the motor shims, on the end against which this pressure is applied.

With certain types of motor mountings, when the belt is tightened, the motor is thrown out of its right angle position with the belt. This results in excessive wear and/or noise between the belt and pulley.

Where the motor is bolted directly to the condensing unit base, either the motor base or condensing unit base has slotted holes to allow movement. When the bolts are loosened to slide the motor the tension of the belt tends to hold the pulley end of the motor and the commutator end is moved more easily, thereby throwing the motor and pulley off at a right angle with the belt.

It is suggested that where possible, the pressure that is being applied to move the motor be applied near the pulley end of the motor, holding the commutator end in line, until the bolts have been tightened with the motor square.

Some condensing unit designs incorporate the use of an automatic belt tension device, which by means of a spring, or by having the motor on rollers, maintains the belt at the proper tension automatically, and requires little attention by the service man.

Where the refrigerator motor is not protected by an overload relay in the temperature control, it must be protected by fuses of the proper ampere rating. A suitable fuse box and across-the-line switch should be installed within reaching distance of the machine. Either one or both sides of the line should be fused.

The following size fuses, of either the plug or cartridge type for the proper protection of the motor, are recommended:

H. P.	Amp. Rating	Voltage
⅛	4	110
⅙	5	110
⅕	5	110
¼	6	110
⅓	7	110

Very often in self-contained installations the motor circuit is plugged into a regular outlet already available for use with electric kitchen appliances. This outlet is usually a part of the house distribution circuit and is subject to overload.

An overloaded circuit will cause the lights to flicker while the motor is in operation. However, before placing the blame for this trouble on the circuit all other possible overload conditions should be checked.

If the system is correct and the lights continue to flicker a special circuit of No. 14 wire should be run from the main distribution box at the meter, taken off ahead of all other circuits. The secondary circuit from the power lines to the house should also be checked for low voltage. If there is low voltage on this circuit the power company will rectify the condition.

71. Capacitor Motor

The capacitor type motor is now being used extensively on household electric refrigerators. Its general design with respect to frame, bearings, oil wells, etc., are the same as the repulsion-induction type.

In place of using a starting winding in the armature, a short circuiting device, and brushes, the capacitor type employs a condenser and transformer housed in a metal box and usually mounted on the outside of the motor frame.

When the electric current is closed, a high voltage is supplied through the transformer for a high-starting torque. When the motor has attained about three-fourths normal speed, a governor device goes into play operating a switch contained in the motor proper, charging the transformer leads to supply the proper voltage for normal load running conditions.

The capacitor motor proper cannot be serviced in the field. It is completely sealed. The governor device is subject to wear and irregular conditions. It is accessible by removing the end plates from the motor.

The switch contacts are silver and should not pit or stick.

Fractional Horsepower Motor

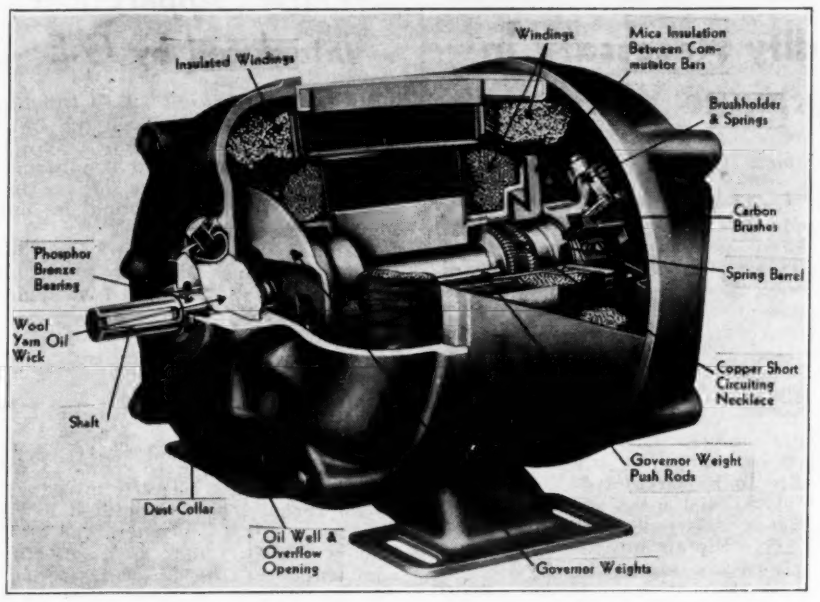


Fig. 120—Cutaway illustration of fractional horsepower repulsion-induction motor built by Century Electric Co., St. Louis. The arrows indicate the important parts of the motor.

Master Service Manual To Be Published About Jan. 1

Published in this issue is Chapter 7, Instalment 1 ("Repulsion-Start Induction-Run Motors") of the Master Service Manual, prepared by K. M. Newcum. The manual is being published serially in Electric Refrigeration News, the first instalment appearing in the April 10, 1935, issue. When all the chapters have been published in the News, the information will be put in book form, with considerable supplementary material.

This manual of information on the design and operation of present-day refrigeration systems will add to the service man's knowledge, and will assist him in meeting specific problems in servicing operations in the field.

Our supply of some of the back issues has been sold out. In order to meet the demand for the complete series we make the following offers to service men:

(1) Send $3.00 for a year's subscription to Electric Refrigeration News to start Aug. 28, 1935, and we will send reprints of all previous Newcum articles (the first six chapters of the book) in pamphlet form (size 6¼x8¾ inches).

(2) Send your advance order for a copy of the Master Service Manual, enclosing $3.00 to pay for the complete book, when published, and we will send you free of charge, reprints of all the Newcum articles published in the News up to and including Aug. 21, 1935. These reprints will be in pamphlet form size 6¼x8¾ inches).

Following is an outline of the subjects and the dates of the weekly issues of Electric Refrigeration News in which the material was published:

Chapter 1—THEORY OF REFRIGERATION (April 10).

Chapter 2—PRINCIPLES OF MECHANICAL REFRIGERATION (April 17).

Chapter 3—COMMON REFRIGERANTS (April 24).

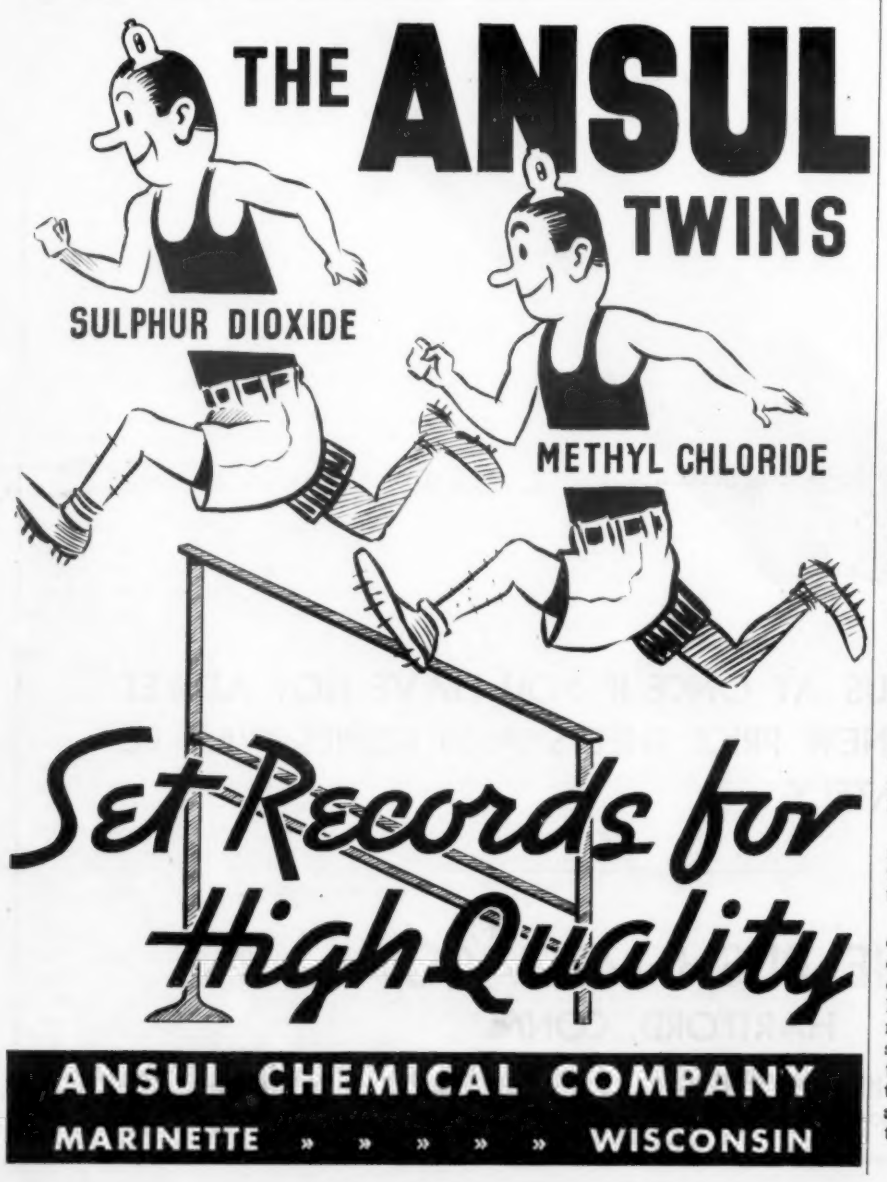
Chapter 4—CONDENSING UNITS.
Instalment 1: description of various compressor parts (May 1).
Instalment 2: stuffing box seals, flywheels, and direct-connected units (May 8).
Instalment 3: rotary compressors (May 29).
Instalment 4: care and servicing of shut-off valves and gaskets (June 5).
Instalment 5: condensers (June 12).
Instalment 6: liquid receivers (June 19).

Chapter 5—EVAPORATORS.
Instalment 1: flooded evaporators with low side float valve (June 26).
Instalment 2: high side float valves and flooded evaporators (July 3).
Instalment 3: automatic expansion valves (July 10).
Instalment 4: automatic expansion valves—continued (July 17).
Instalment 5: thermostatic expansion valves (July 24).

Chapter 6—CONTROLS
Instalment 1: low pressure controls (July 31).
Instalment 2: low pressure controls continued (August 7).
Instalment 3: thermostatic controls (August 14).
Instalment 4: thermostatic controls continued (August 21).

Chapter 7—MOTORS
Instalment 1: repulsion start-induction run motors (August 28).
Instalment 2: repulsion start-induction run motors (continued) and capacitor motors (September 4).

Also published in this issue is No. 21 "Service Operations," a series of lessons outlined for the use of the service manager in instructing beginners.



Askin Tells Uses of Heat Interchanger

By Joe Askin, Chief Engineer, Fedders Mfg. Co.

A heat interchanger, composed of two concentric copper tubes, has many interesting and valuable uses.

A. *Use as heat interchanger to warm the suction gas* (See Fig. 1).

In using a heat interchanger for this purpose the liquid from the receiver passes through the inner tube and the gas leaving the evaporator passes between the outer wall

Fig. 1—Two concentric copper tubes used as heat interchanger to warm the suction gas.

of the inner tube and the inner wall of the outer tube.

Should the heat interchanger be used for the purpose of eliminating back frost, which is equivalent to refrigerating "the great outdoors," the capacity of the system may be increased up to as much as 15 per cent.

Should there not be any back-frost, an increase in efficiency may be obtained by opening the thermostatic expansion valve, allowing more refrigerant to enter the coils. This, in effect, eliminates the super-heat of the gas in the evaporator—the superheat occurring in the heat interchanger.

Any installation, whether flooded, dry, or semi-flooded, whether non-frost or force-draft, can be improved by installing a heat-interchanger. The setting of the thermostatic expansion valve is a good deal less sensitive and the capacity of either the evaporator or condensing unit, or both, may be increased.

B. *Use as a water-cooled condenser* (See Fig. 2).

(It sometimes becomes necessary to convert an air-cooled condensing

Fig. 2—Tubes used as water-cooled condenser.

unit into a water-cooled unit. Purpose—to increase condensing unit capacity.

An increase in condensing unit capacity is the result of a lower gas temperature due to the fact that the cooling water temperature is usually lower than that of the air. A high pressure cut-out switch should be installed.

C. *Use as a heat interchanger in water coolers* (Fig. 3).

The drain water flowing between the two tubes cools off the incoming

Fig. 3—Used as heat interchanger in water cooler.

fresh water flowing through the inner tube, before it reaches the evaporator.

When the number of people using a pressure water cooler has been increased beyond the number which was anticipated when the purchase of the cooler was made, a device of this sort will often eliminate complaints of warm drinking water.

D. *Use as a water cooling evaporator* (Fig. 4).

By operating at a high suction pressure, freezing of the water may be avoided. The refrigerant flowing

Fig. 4—Used as water-cooling evaporator.

between the tubes cools the water flowing through the center tube. The outside should be well insulated.

Fig. 5 shows fittings developed at the laboratory of the Fedders Mfg. Co. These fittings fill a need of the service organization for an assembly which could be easily made in the

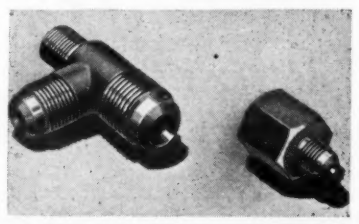


Fig. 5—Fittings developed by Fedders Mfg. Co. for use on heat interchangers.

field with ordinary flaring tools, an assembly which could be made without soldering, and is low in cost.

Fig. 6 shows a partially assembled heat interchanger coil.

If necessary, the tubes can be shaped by bending them around an ordinary barrel.

From 10 to 50 ft. for each tube, depending upon the requirements of the job, should be used in making up heat interchangers.

When used as a heat interchanger between liquid refrigerant to the evaporator and the suction vapor from the evaporator it is a general rule to use 1 ft. of heat interchanger tubing for approximately 250 B.t.u.'s per hour evaporator capacity. This refers to the ¼ in. and ⅝ in. tube combination, having ¼ in. and ½ in. S.A.E. male flare connections.

For greatest efficiency of the heat interchanger it is advisable to use the counterflow principle. This means that the warmer end of the first fluid should be in thermal contact with the warmer end of the second fluid, and the colder end of the first fluid should be in contact with the colder end of the second fluid. This results in a greater logarithmic mean temperature differential between the two fluids and a greater heat transfer.

Heat Interchanger Coil

Fig. 6—Partially assembled heat interchanger coil.

SERVICE OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER IN INSTRUCTING BEGINNERS IN SERVICE WORK

No. 21—Changing the Expansion Valve

By K. M. Newcum

REASON:

Same as Lesson No. 18.

PROCEDURE:

A. Proceed as in Lesson No. 2, steps A, B, C, D, E, F, G, H.

B. Disconnect the liquid line from the expansion valve, inserting flare plug in opening and placing seal cap on expansion valve fitting.

C. Remove expansion valve by either unscrewing or removing the hex-cap screws that hold it in place.

D. Insert wooden plug or pipe plug in opening in coil and scrape all traces of the old gasket from the flange. (This applies to valves using the flange-type fitting and not the screw-type valves).

E. Remove pipe plug or wooden plug from opening in coil. Place new gasket in place and install new expansion valve.

F. Remove flare plug from liquid line and connect liquid line to expansion valve fitting.

G. Purge the lines (refer to Lesson No. 6). Test for leaks.

H. Check with the instructor.

Armstrong Tells about Erecting Insulation

LANCASTER, Pa.—A folder describing the sundry materials required for the proper installation of insulation has recently been prepared by the Armstrong Cork Products Co. of Lancaster, Pa.

Since the method of erecting insulation has such an important bearing on the efficiency of the insulation under actual service conditions, Armstrong officials believe that manufacturers and distributors engaged in installing commercial jobs will find the information helpful.

Among the items described in the folder are asphaltic paint, used for priming concrete or portland cement plastered surfaces against which the insulation is to be erected; erection asphalt, used for bonding the insulation; waterproof cement for applying corkboard and cork covering; galvanized nails, and wooden skewers.

Delavan & Boalt Elected Vice Presidents of Penn Switch Co.

DES MOINES—Nelson B. Delavan and Ben L. Boalt have been elected vice presidents of the Penn Electric Switch Co. Mr. Delavan and Mr. Boalt will retain their former positions, as director of sales, and head of the heat control division, respectively.

K. W. Cash has been appointed advertising manager and sales promotion director of this company.

Frank Will Direct Sales Of Richmond Co.

PHILADELPHIA—Vernon L. Frank, formerly sales manager for the Ridgway Refrigeration Co., has been appointed general sales manager of the Richmond Engineering Co. The Richmond company manufactures ice water generators, aluminum fans for ventilating, diffusers, and fin coils and condensers.

Parker Re-elected President Of Summerill Tubing

BRIDGEPORT, Pa.—M. L. Parker was re-elected president of the Summerill Tubing Co., at a board of directors meeting held here recently. J. F. Beere, who has been assistant to the president for the last two years, was elected vice president. George P. Kraemer will fill the office of secretary and treasurer.

Fish Bar & Restaurant Installs Frick Units

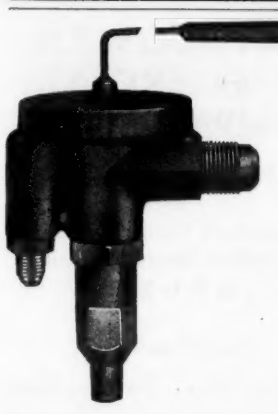
CHICAGO—Two Frick low-pressure condensing units of 3 hp. and ½ hp. are used to cool a walk-in storage box, service box, salad box, salad pan, salad storage, back bar bottle storage, beer storage, and 25 gal. of water per hour at the Fish Bar & Restaurant, 32 S. Michigan Ave. here.

Davis Distributes Seeger Cases in Baltimore

BALTIMORE — The commercial sales division of F. A. Davis & Sons, Inc., Frigidaire distributor here, has been appointed distributor also for Seeger refrigerated display cases.

BUYER'S GUIDE

MANUFACTURERS SPECIALIZING IN SERVICE TO THE REFRIGERATION INDUSTRY



PEERLESS THERMAL EXPANSION VALVES

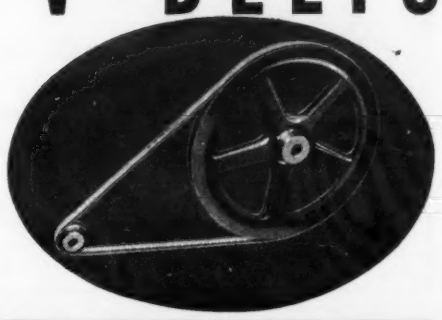
for Methyl Chloride, Sulphur Dioxide, Freon, and Ammonia

1. No bellows to leak.
2. No possibility of moisture condensation interfering with valve action.
3. Tried and proven in every section of the country.
4. Competitively priced.

PEERLESS ICE MACHINE CO.
CHICAGO 515 W. 35th St. TWO FACTORIES NEW YORK 43-00 36th St. L.I.C.

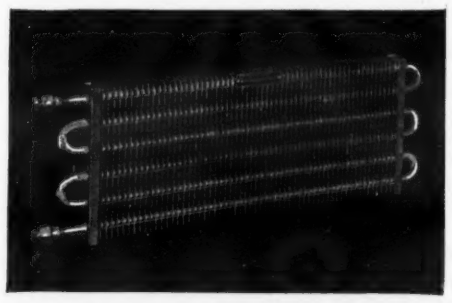
DAYTON V•BELTS

There is a Dayton V-Belt made especially for all makes and types of refrigerators, washing machines and other appliances. A stock is available near you. Send for price list and name of your nearest distributor.



THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO
The world's largest manufacturer of V-Belts

TYPE KR-12 Models
RANCOSTAT
The Stainless Steel Thermostat
Nothing short of perfection satisfies refrigerator owners today. Ranco controls are built to meet such expectations. Built for permanently dependable operation. Simple construction - - - fewer working parts - - - less friction. Working parts are accurately machined - - - a precision-built instrument. Write for KR Bulletin.
The Automatic Reclosing Circuit Breaker Co.
Columbus, Ohio



REMPE FIN COILS
CHICAGO

STANDARD REFRIGERATING APPLIANCES

AUTOMATIC SUCTION PRESSURE THROTTLING VALVE

Write for bulletin on complete line covering refrigerating appliances, liquid line filters, dehydrators, acid neutralizers, standard parts and materials, service tools, shaft seals, bearing metals and parts. Descriptive literature will be gladly furnished on any or all of these lines on request.

AMERICAN INJECTOR COMPANY 1481-14th. Street, Detroit, Mich.

A convenient way to keep your back issues of the News

We offer a binder designed and made especially for keeping your file copies of Electric Refrigeration News neat and always available for ready reference.
It is made of stiff board covers, attractively bound in good quality of black imitation leather. The name Electric Refrigeration News is stamped in gold on the front cover and backbone.
The price is $3.75 shipped to you post paid in the United States and Possessions and Pan-American Postal Union countries. For all Foreign countries, postage based on a shipping weight of 6 pounds must be added to this price. Send your remittance with order. May we send you one?

Electric Refrigeration News, 5229 Cass Ave., Detroit. Mich.

ERMSTAT
FULLY AUTOMATIC MOTOR CONTROL
Because it protects the motor from overloads, it prevents the troubles caused by burned-out motors. Ermstat Fully Automatic Electric Motor Overload Protection decreases service calls and considerably lessens spoilage of ice cream and other contents
Write for details Ermstat Co. 1825-39 Wylie St., Philadelphia
MELCHIOR, ARMSTRONG, DESSAU CO., INC., EASTERN DISTRIBUTORS
PHILADELPHIA, NEW YORK, BOSTON, BALTIMORE

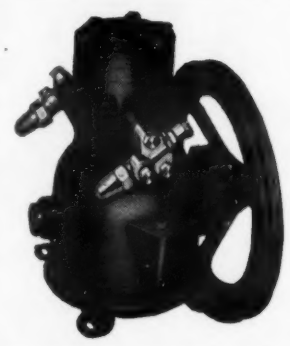
BUYER'S GUIDE

MANUFACTURERS SPECIALIZING IN SERVICE TO THE REFRIGERATION INDUSTRY

MAYFLOWER COMMERCIAL COMPRESSORS
Invite Your Attention

Aircooled and Watercooled SO2 and Methyl Chloride Models
1/3 H. P. to 2 H. P.

Manufactured by
HARDY MANUFACTURING CO., Inc., 100 Davis Ave., Dayton, Ohio

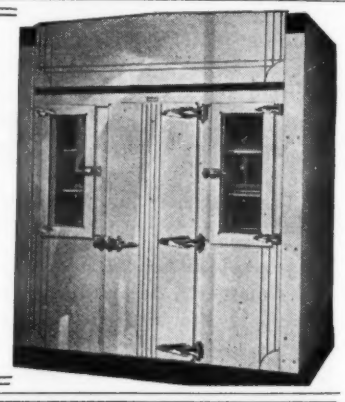


CONDENSING UNITS AND COMPRESSORS FOR HOUSEHOLD REFRIGERATION BY
JOMOCO, INC.
A SUBSIDIARY OF THE
JOHNSON MOTOR CO.
Waukegan, Ill.
CABLE ADDRESS: JOMOCO-WAUKEGAN

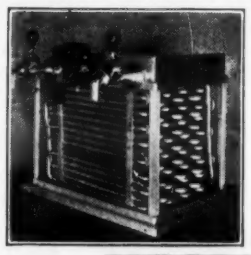
KOCH COMMERCIAL REFRIGERATOR CABINETS
All types and sizes of heavily insulated refrigerators and display cases.

WANTED
Distributors and Sales Agents
Attractive sales proposition. Some good territories available. Many exclusive features. Write for information, and submit your qualifications.

KOCH REFRIGERATORS
North Kansas City, Mo.



ATTENTION REFRIGERATION DEALERS!



In your next beer installation, try this cooler and you too will be convinced.
1. Insures not only customers, but also your satisfaction.
2. Perfect beer dispensing, without any service calls.
3. Not only cold, but carbonized "live beer".
4. No motors, no moving parts, easy to multiplex without any extra controls.
5. In case of mechanical trouble, no interruption of customers business, can be used with ice.

IT HAS EVERYTHING & THE PRICE IS RIGHT

ONE DRAW BEER COIL COMPANY
Manufacturers of all kinds of Liquid Coolers
435 Collinsville Ave., East St. Louis, Ill.

PURO ELECTRIC WATER COOLERS
Thoroughly reinforced all steel attractively finished cabinets.
Different models of varying capacities.
Write for details and sales prices.
Puro Filter Corporation of America
440 Lafayette Street, New York City Spring 7-1800

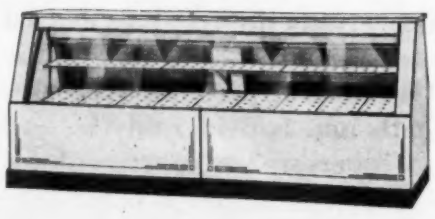
BOUND VOLUMES of ELECTRIC REFRIGERATION NEWS

A limited number of recent volumes are available. Each of the following volumes contains all weekly issues of Electric Refrigeration News issued during a period of four months. Stiff paper board covers.

Vol. 8—Jan. 4 to April 26, 1933. (Serial Nos. 198 to 214.)
Vol. 9—May 3 to Aug. 30, 1933. (Serial Nos. 215 to 232.)
Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)
Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)
Vol. 12—May 2 to Aug. 29, 1934. (Serial Nos. 267 to 284.)
Vol. 13—Sept. 5 to Dec. 26, 1934. (Serial Nos. 285 to 301.)
Vol. 14—Jan. 2 to April 24, 1935. (Serial Nos. 302 to 318.)

Price $3.00 per volume, f.o.b. Detroit. Shipment will be made by express collect unless otherwise specified. Please send remittance with order.
Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

"DRY-KOLD", *A COMPLETE LINE!*



Refrigerator Display Cases
Meat Coolers Fish Cases
Complete Market Equipment

Refrigerators for Hotels, Restaurants, Florists, Delicatessens

Furnished with coils or without

Territory open for good dealers

The "DRY-KOLD" REFRIGERATOR CO., Niles, Michigan

PATENTS

Issued Aug. 20, 1935

2,011,647. TUBE COOLING DEVICE. Ilia E. Mouromtseff and Harrell V. Noble, Wilkinsburg, Pa., assignors to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application July 30, 1932. Serial No. 626,842. 4 Claims. (Cl. 250—27.5.)

2,011,731. REFRIGERATED SHOW CASE. Charles E. Rorrer and Albert R. Mitterer, Denver, Colo., assignors to Stadium Stores, Inc., Denver, Colo. Application Oct. 17, 1932. Serial No. 638,052. 17 Claims. (Cl. 62—89.5.)

2,011,787. THERMOSTAT CONTROL FOR AIR CONDITIONERS FOR ROOMS. Frank A. Whiteley, Minneapolis, Minn. Application Jan. 25, 1932. Serial No. 588,578. Renewed March 26, 1934. 12 Claims. (Cl. 236—44.)

2,011,881. COOLING UNIT. William M. Stewart, San Francisco, Calif. Application July 31, 1933. Serial No. 682,997. 11 Claims. (Cl. 62—91.5.)

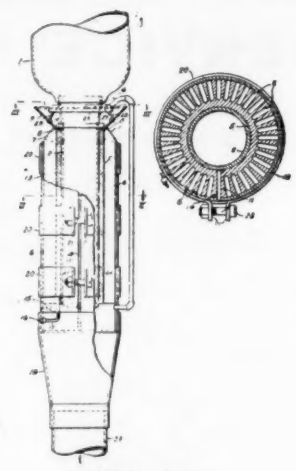
2,011,964. REFRIGERATING MACHINE. Mustafa J. Ajam, Waltham, Mass., assignor to Devon Mfg. Co., Boston, Mass., a corporation of Massachusetts. Application July 28, 1931. Serial No. 553,552. 15 Claims. (Cl. 62—136.)

2,012,068. THERMOSTATIC VALVE. William J. McGoldrick, Watertown, Mass., assignor to The Bishop & Babcock Mfg. Co., Cleveland, Ohio, a corporation of Ohio. Application June 9, 1932. Serial No. 616,344. 11 Claims. (Cl. 236—93.)

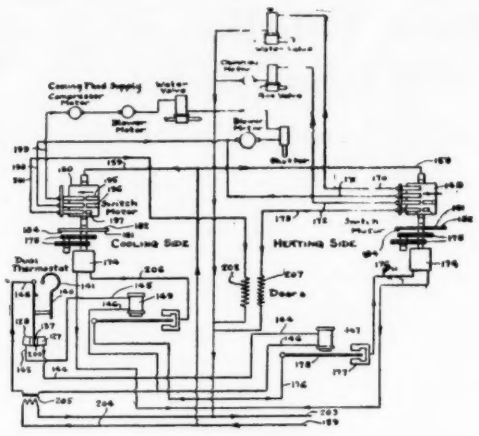
2,012,183. SHELL AND TUBE EVAPORATOR. Willis H. Carrier, Elizabeth, N. J., assignor to Carrier Engineering Corp., Newark, N. J., a corporation of New York. Application March 9, 1934. Serial No. 714,767. 7 Claims. (Cl. 62—126.)

2,012,190. REFRIGERATING DEVICE. John P. Green, Philadelphia, Pa. Application Jan. 30, 1934. Serial No. 709,021. 5 Claims. (Cl. 62—91.5.)

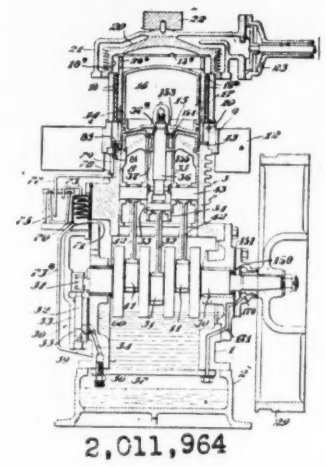
2,012,209. REFRIGERATING UNIT. Walter W. Williams, Bloomington, Ill. Application Aug. 14, 1933. Serial No. 685,020. 6 Claims. (Cl. 62—115.)



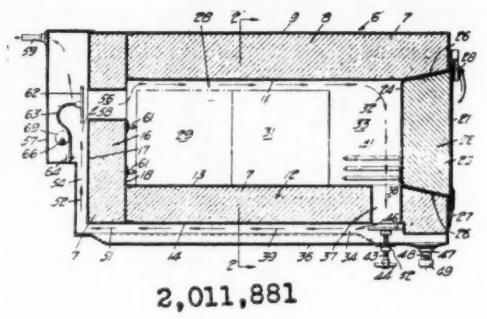
2,011,647



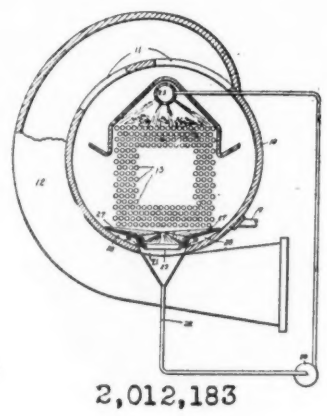
2,011,787



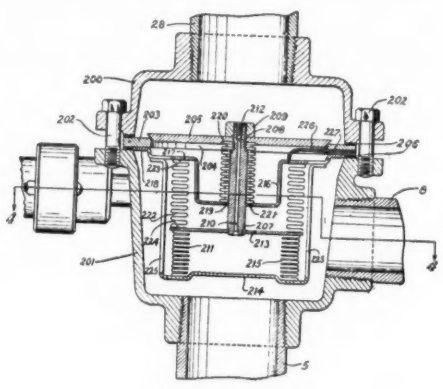
2,011,964



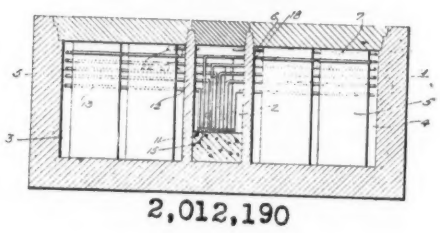
2,011,881



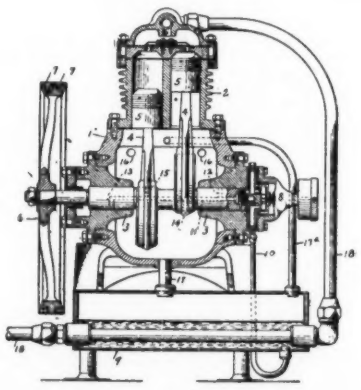
2,012,183



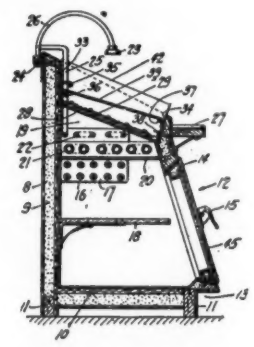
2,012,068



2,012,190



2,011,731



2,012,209

BOOKS

The Formation of Capital

Author: Harold G. Moulton. Publisher: The Brookings Institution, Washington, D. C. Pages: 203. Price: $2.50.

PURPOSE of this book, "The Formation of Capital," is to analyze the process of capital creation, and to track down the factors which govern the rate-of-growth of plant and equipment.

To establish a logical basis upon which to build his theories and conclusions, the author immediately sets up his definition of capital as "the concrete material instruments which aid man in the process of production."

In this definition he distinguishes the true meaning of the term from the ideas generally held in regard to its definition. He states that in any economic system the formation of capital involves an allocation of the productive energy of society.

The formation of capital under primitive conditions, under a communistic society, and under a capitalistic society is then made the threeply topic for a serious discussion.

Of this process, Mr. Moulton says: "Creation of capital under a capitalistic system involves a process which, operating in response to the profit motive, transforms monetary savings into capital goods."

Contrary to popular opinion, the book holds that "when the proportion of the national income that is saved expands rapidly, a maladjustment which retards, rather than promotes the expansion of capital, results."

Interesting to the layman are the chapters devoted to a discussion of the method by which the commercial banking system manufactures credit, the general evolution of the credit structure in the United States, and the character and operations of the commercial banks. Other chapters trace the part of commercial banking systems in the formation of capital.

Pertinent to understanding the work done recently under the Reconstruction Finance Corp., is the book's discussion of the creation of capital through government instrumentality. This chapter contains a detailed account of the Federal Government expenditures for capital purposes during the period from 1930-34.

For those who might happen to get lost in the midst of the economic-structural explanations and deviations, Mr. Moulton summarizes his theories and conclusions in a clear cut, precise manner.

In part, his conclusive statements hold that "if new capital is to be created there must be an increasing flow of funds through consumption channels as well as through savings channels. . . facts show incontrovertibly that new capital is constructed on an extensive scale when consumption is expanding rather than when it is contracting."

He has included the analyses of the savings process formulated by other writers in a special index chapter. Extracts from the writings of F. A. von Hayek, Benjamin M. Anderson, E. F. M. Durbin, John A. Hobson, W. T. Foster, Waddill Catchings, Major C. H. Douglas, and Paul H. Douglas.

Diagramatic sketches and statistical tables are used frequently throughout the book to enable readers to visualize various aspects of the economic structure.

This book is the third in a series of four volumes, published by The Brookings Institution, in which a complete analysis is made of the relation of the distribution of national wealth and income to progress. Others are: "America's Capacity to Produce" (Reviewed in Oct. 24 issue of the NEWS), and "Income and Economic Progress."

"The Formation of Capital" is a book for pipe-smoking men to read on not too warm nights.

● *Extra Dry* ESOTOO
LIQUID SULPHUR DIOXIDE
● V-METH-L
METHYL CHLORIDE

WEST NORFOLK, VA.
131 State St., Boston, and
76 Beaver St., New York

Refrigeration to Be Shown At Baltimore Food Show From Oct. 26 to Nov. 2

BALTIMORE—Manufacturers and distributors of refrigerating equipment will participate in the Annual Baltimore Food Show, scheduled for Oct. 26 to Nov. 2 inclusive, at the new Fifth Regiment Armory, by placing exhibits of their products. Approximately 200,000 persons attend these annual shows at which 300 exhibitors display their merchandise.

May-Stern Sales in St. Louis Are High in August

ST. LOUIS—Sales of household electric refrigerators by the Union-May-Stern, house furnishings firm here, during the first part of August were running ahead of July sales, and July sales had topped June sales, reports Frank Walsh, manager of the refrigeration department.

Fulmer Is Distributor for Hussmann Cases

DETROIT—New Detroit distributor for Hussmann-Ligonier Humid-I-Coiled refrigerators, manufactured by the Allied Store Utilities Co., St. Louis, is Carl S. Fulmer.

Denney Named Dealer for Lipman Machines

TAKOMA PARK, Md. — Denney Refrigeration Service Co. of this city was recently enfranchised to handle the Lipman equipment in the Washington, D. C., territory, for the General Refrigeration Sales Co., Beloit, Wis.

KRAMER
UNIT COOLER
Manifolded for FREON
and greater than 20° air to refrigerant differentials.
Maximum Fin Coil Surface on 5/8" O. D. Tube.
All Copper. Casing Brass. Entirely non-corrosive.

COOLERS — EVAPORATORS — CONDENSERS — COOLING COILS
TRENTON AUTO RADIATOR WORKS
210 West 65th, N.Y.C. TRENTON, N.J. 5114 Liberty Ave., Pittsburgh, Pa.

Just Out New **BIG CATALOG**
Refrigerator service men and dealers send for our catalogue No. 110 showing lowest net prices on thousands of parts and accessories for all makes. Write us on your letter head today.
The **HARRY ALTER CO.**
1730 S. MICHIGAN AVE. CHICAGO, ILL. U.S.A
8000 ITEMS FOR ALL MAKES
DOMESTIC COMMERCIAL AIR CONDITIONING

REFRIGERATOR PARTS
Big Specialized Refrigerator Parts Catalog lists complete line of **Refrigerators** and hundreds of essential parts for all standard makes. Tubing, brass fittings, gaskets, thermostats, pressure gauges, valves, evaporators, expansion valves, filters, dehydrators, tools. Inspect our catalog listing everything at **Lowest Wholesale Prices!** Address Dept. ER-945.
BIG *Specialized* CATALOG *Free*
WHOLESALE RADIO SERVICE CO., INC.
100 SIXTH AVENUE - NEW YORK, N.Y.
ATLANTA, GA. NEWARK, N.J.

Everything Needed **PARTS-SUPPLIES-TOOLS**
FOR SERVICING *and* **INSTALLING ALL MAKES OF REFRIGERATION EQUIPMENT**
We have what you need for repairing and installing all types of domestic and commercial refrigeration equipment. Our stock is complete. Our service is speedy and accurate. We are as near you as your telephone. Send business card or letterhead for our elaborate Free catalog.
WHOLESALE ONLY
For Your Protection
IMMEDIATE SERVICE
AIRO SUPPLY COMPANY
Successors to Utilities Engineering Sales Co.
Telephone: DELaware 5350 408-10 N. Wells St., Chicago

Group Subscription Rates

REFRIGERATION NEWS
1935 REFRIGERATION & AIR CONDITIONING DIRECTORY
1935 REFRIGERATION & AIR CONDITIONING MARKET DATA

The following special rates are for PAID-IN-ADVANCE subscriptions only in the United States and Possessions and Pan-American Postal Union Countries. Charge orders are billed at the single-subscription rate, regardless of number. Papers will be mailed to individual addresses.

	Electric Refrigeration News (weekly)	1935 Refrigeration Directory and Market Data Book (2 volumes)	Both Electric Refrigeration News and Refrigeration Directory
1 subscription	$3.00	$5.00	$6.50
5 or more each	2.75	4.50	6.50
10 or more each	2.50	4.00	6.50
20 or more each	2.25	3.50	5.75
50 or more each	2.00	3.00	5.00
75 or more each	1.75	2.50	4.25
100 or more each	1.50	2.00	3.50
For All Other Countries (Except Canada)			
1 subscription	$5.00	$6.00	$9.00
5 or more each	4.75	5.50	8.50
10 or more each	4.50	5.00	8.00
20 or more each	4.25	4.50	7.50
50 or more each	4.00	4.00	7.00
Canadian Rates (including tariff of 5 cents per copy on the News)			
1 subscription	$6.00	$6.00*	$11.00*
5 or more each	5.75	5.50*	10.50*
10 or more each	5.50	5.00*	10.00*
20 or more each	5.25	4.50*	9.50*
50 or more each	5.00	4.00*	9.00*

*Canadian subscribers are required to pay a tariff and excise tax on the Directory and Market Data Book which amount to $1.00. These extra charges on books will be collected by the Canadian postoffice at the time of delivery.

Subscription Order

Business News Publishing Co.
5229 Cass Ave., Detroit, Mich. Date.....

☐ Enter my subscription to Electric Refrigeration News for one year (52 issues).
☐ Send the 1935 Refrigeration Directory and Market Data Book (2 volumes).
☐ Enclosed find remittance. (See rates above.)

Name .....

Attention of
In Care of .....

Street Address .....City and State.....

We sell the.....refrigerator and .....
(Please indicate other products or principal line of business.)
9-4-35

QUESTIONS

Production Figures

No. 2435 (Manufacturer, Michigan)—"Please send us copies of ELECTRIC REFRIGERATION NEWS showing the refrigeration production for May, June, and July."

Answer: Figures on the production of household electric refrigerators are not being issued by the Refrigeration Division of National Electrical Manufacturers Association this year. Production figures were given out in 1934 only.

Total sales figures of household electric refrigerators for May were published in the July 17 issue of the NEWS. Sales figures for June appeared in the July 31 issue. The July figures are not available as yet.

Air-Conditioning Book

No. 2436 (Engineer, Holland)—"Will you let me know if there are any technical books or booklets available about air conditioning, and if so, at what price? What I mean is a technical handbook giving information about making complete lay-outs and calculation."

Answer: We have not published any books on air conditioning, but a great deal of timely information on this subject is published in the weekly issues of ELECTRIC REFRIGERATION NEWS, the weekly newspaper of both the refrigeration and air-conditioning industries. Every issue of the NEWS contains considerable air-conditioning information, with one issue each month devoted especially to this subject.

Specifications for 1935 air-conditioning equipment were published in the May 22 issue of ELECTRIC REFRIGERATION NEWS. Back issues of the NEWS can be obtained at a cost of 10 cents each.

Strictly technical information giving engineering data, calculation, and lay-out is incorporated in the 1935 Guide of the American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York City. Price of this book is $5.00 per copy.

Dry Ice Refrigerator

No. 2437 (Dealer, Ohio)—"Do you know of a firm who can furnish a unit that will set in an ice box that uses dry ice for the refrigerant?"

Answer: Try International Carbonic Engineering Co., Kennett Square, Pa.

Dairy Cooling

No. 2438 (Manufacturer, Illinois)—"I am trying to gather together as much information as possible on dairy cooling in the way of literature, market, sizes, and performance.

"No doubt you can supply me with some information, or can advise me the source to contact. I would appreciate it very much if you would let me have your comments on this subject."

Answer: The July 4, 1934, issue of ELECTRIC REFRIGERATION NEWS devoted special editorial material to farm milk cooling, and the May 8, 1935, issue of the NEWS gives the results of a government survey on milk cooling with mechanical refrigeration.

Manufacturers of farm milk-cooling equipment are listed in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Design & Construction

No. 2439 (Manufacturer, California)—"We wish to collect data and information on the design, construction, and servicing of the latest refrigeration compressor units in domestic and small commercial applications up to and including 1½ hp.

"We enclose our order to cover any issues of the ELECTRIC REFRIGERATION NEWS which describe such units, showing construction details, cuts, description of parts, and servicing articles, also any engineering articles on compressor design, going back possibly through the past year or two covering the latest developments in the subject."

Answer: ELECTRIC REFRIGERATION NEWS has published several reports about the development of new units. While some of these articles do not give a complete description of the units, they tell of new developments in design and construction which have been incorporated in some of the recent models. A list of issues giving page references and headlines are as follows:

Feb. 8, 1933—"Full Length of Box Used for Food Storage," page 1; and "Refrigeration Machine Manufacturer Requires Close Tolerances"—page 18.

Jan. 10, 1934—"Description of Crosley Unit"—page 12.

Jan. 24, 1934 — "Stewart-Warner Compressor Is Refined"—page 1.

March 14, 1934—"York Develops New Freon Machines"—page 1.

March 21, 1934—"Condensing Unit of Monitor Top Improved"—page 10.

May 9, 1934—"Four Commercial Units Added by Westinghouse"—page 1.

Sept. 19, 1934—"Thermal Units Bring Out New Type of Machine with Rotating Cylinder Block"—page 1.

Nov. 7, 1934—"Compressor for Fairbanks-Morse 1935 Line Designed Without Piston Rings"—page 16.

Jan. 2, 1935—"How to Service Compressor Shaft Seals"—pages 6 and 7.

Jan. 23, 1935—"Westinghouse Engineer Explains How Changes Were Analyzed and Made in Designing Unit for Freon"—page 13.

Feb. 27, 1935—"G-E Introduces 4 New Models and Forced Oil Lubrication"—pages 1 and 4.

A series of articles by K. M. Newcum which has been running in ELECTRIC REFRIGERATION NEWS, starting in the April 10, 1935, issue, includes articles on compressor design and servicing.

Data on Refrigerators

No. 2440 (Association, New York)—"One of our member companies has asked us for information on electric refrigerators that we do not seem to have compiled. The inquiry asks for the operating characteristics of various types of domestic electric refrigerators—what they term rating and operating data. We are assuming that they refer to current consumption, size of motors, kinds of refrigerants, etc.

"We are under the impression that data of this sort has been published in ELECTRIC REFRIGERATION NEWS. If so we would appreciate your advising which issue or issues. If we are mistaken in this could you advise us what sources to approach for such information?"

Answer: Data on operating characteristics for various makes of household electric refrigerators were published in the June 12 issue of ELECTRIC REFRIGERATION NEWS, which presented complete specifications on all leading makes of household units.

Unfortunately, our supply of these issues has been sold out, so if you haven't a copy of the June 12 issue in your file, you will have to try to borrow one or get it in the public library.

We have not published any data on tests showing the current consumption of the different makes.

Commercial Specifications

No. 2441 (Engineer, New York)—"Some time ago you kindly provided us with a copy of the June 12, 1935, issue of ELECTRIC REFRIGERATION NEWS which gave considerable data on household refrigerating units. We are now desirous of obtaining similar information on larger refrigerators, such as those used in retail meat markets, restaurants, stores, etc., and we are wondering whether you have ever published such data on units say up to 3 hp. in capacity. If you have not, perhaps you can tell us where such data could be obtained."

Answer: Specifications of commercial refrigeration machines (1935 models) were published in the April 3 issue of ELECTRIC REFRIGERATION NEWS.

Refrigerator Accessories

No. 2442 (Export Firm, New York)—"Our home office in the Philippine Islands is interested in utensils used in refrigerators, such as refrigerator bottles, glass refrigerator sets for keeping food remnants, vegetable fresheners, etc., and we were wondering if you would know of a publication which lists such manufacturers."

Answer: Manufacturers of household refrigerator accessories of this type are listed starting on page 253 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Portable Conditioners

No. 2443 (Dealer, Ohio)—"We would like a list of the firms who are manufacturing portable air conditioners."

Answer: There has been considerable controversy in the air-conditioning industry as to just what constitutes a portable air conditioner. The following manufacturers claim to make a portable unit:

General Electric Co.
Air Conditioning Dept., Bloomfield, N. J.
Strang Air Conditioning Corp.
215 E. 20th St., Kansas City, Mo.
Westinghouse Electric & Mfg. Co.
Mansfield, Ohio.
York Ice Machinery Corp.
York, Pa.

Directory & Data Book

No. 2444 (Distributor, New York)—"Will you please advise us as to your REFRIGERATION DIRECTORY AND MARKET DATA BOOK, which I understand is published yearly.

"I am interested in learning where standard materials used in the various phases of refrigeration construction can be purchased."

Answer: The 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY and MARKET DATA BOOK has been published in two volumes this year.

Volume 1, the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY, lists all manufacturers of refrigeration and air-conditioning equipment, parts, materials, supplies, and accessories. The book is divided into four sections: (1) alphabetic list of manufacturers; (2) index of trade names; (3) classified list of refrigeration equipment; (4) geographical directory giving name, address, telephone number, products, and executive personnel of the various manufacturers. Also listed are jobbers of supplies, parts, and materials.

Volume 2, the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK, presents all known statistical facts about the refrigeration and air-conditioning industries, including an analysis of the market and a survey of distributive channels.

CLASSIFIED

RATES: Fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

DISTRIBUTORS' and Manufacturers' representative, or salesman, calling on refrigeration supply jobbers, service men and dealers. Restricted territory now available to distribute Goodyear V Belts on an attractive commission basis. Write stating full qualifications. Box 724, Electric Refrigeration News.

DISTRIBUTOR of Carrier air conditioning and Carrier-Brunswick refrigeration wants experienced commercial salesman who can develop into sales manager. Opportunity of a lifetime but only real producer need apply. Give detailed record. All replies strictly confidential. Box 725, Electric Refrigeration News.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

REPAIRS

HALECTRIC thermostat repair service. B & B, G.E., Cutler-Hammer, Penn, Ranco, Tag., etc. Expansion valves repaired. Gas service, Ethyl, Methyl, Iso-Butane, Sulphur. Your cylinder or ours. Competitive prices. Halectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

BRUNNER
Send for the New
REFRIGERATION CATALOG
Eight Models of Compressors
Forty-one Models of Highsides
from 1/6 H. P. to 15 H. P.
BRUNNER MANUFACTURING CO.
UTICA, N. Y.

LARKIN COILS
for...
AIR CONDITIONING

TEMPRITE
INSTANTANEOUS
BEER and WATER COOLERS
DETROIT MICHIGAN